CONCURRENT MANAGEMENT OF PERSONALLY VALUED AND CONFLICTING LEISURE TIME GOALS: IDENTIFYING SOCIAL COGNITIONS THAT PREDICT EXERCISE VOLUME

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By

Jocelyn E. Blouin

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ABSTRACT

Recommendations are for adults to accumulate 150+ minutes of moderate-vigorous exercise each week to achieve health benefits. Unfortunately, approximately 80% of adults fail to meet the recommendation. "Lack of time" is one of the most commonly reported barriers to exercise, yet, adults report having 330 minutes each day to engage in leisure activities. Leisure activities are freely chosen, motivated, goal-directed activities that are pursued during individuals' free time (e.g., exercise; socializing; hobbies). According to social cognitive theory, concurrent management of exercise and other leisure activity goals may challenge successful exercise self-regulation. Prior research has found that concurrent self-regulatory efficacy beliefs, or confidence to manage multiple goals including exercise at the same time, significantly predicted exercise across various adult samples. However, the extent to which concurrent goals conflict with each other, termed intergoal conflict, has not shown consistent relationships with behaviour. This may have been because methodologies used in prior research did not seem to ensure that concurrent conflicting goals were highly valued, thereby they did not create a true challenge to exercise conduct. Further, social cognitive theory contends that positive outcomes expectations that individuals expect to achieve from exercise should predict their exercise. However, outcome expectations have yet to be examined in the pursuit of concurrent conflicting exercise and non-exercise goals. Thus, the study purpose was to examine whether intergoal conflict and the likelihood and value of positive exercise outcome expectations predicted moderate-vigorous exercise beyond concurrent self-regulatory efficacy when concurrent conflicting goals were highly valued. Adult exercisers (N = 87; M_{age} = 31.67 ± 10.90 years) from Canada and the United States reported having plans to pursue highly valued and conflicting moderate-vigorous exercise and non-exercise leisure time goals during the following month. At Time 1, participants completed an online survey that assessed concurrent self-regulatory efficacy, intergoal conflict, likelihood and value of positive exercise outcome expectations, and demographics. At Time 2, participants reported their moderate-vigorous exercise over the prior month via an online survey. To investigate the study purpose, a three-step hierarchical multiple regression analysis predicting Time 2 exercise was conducted. Step 1 included demographics that were significantly associated with Time 2 exercise (i.e., age and income). Step 2 included concurrent self-regulatory efficacy and Step 3 included intergoal conflict and outcome expectations. The overall model was

significant; F (6, 80) = 5.48, $p < .001$, $R^2_{adjusted} = .24$. The addition of intergoal conflict and outcome expectations in Step 3 accounted for an additional and significant 13% of the variance in Time 2 exercise ($p < .01$). In the final regression model, concurrent self-regulatory efficacy (β = .20; $sr^2 = .03$), intergoal conflict (β = -.23; $sr^2 = .05$), and the likelihood of positive exercise outcome expectations (β = .27; $sr^2 = .06$) were significant predictors (p's < .05). However, the value of outcome expectations was not a significant predictor. Results were largely in line with contentions from social cognitive theory illustrating that participants who reported higher concurrent self-regulatory efficacy, lower intergoal conflict, and that positive exercise outcomes were likely to occur, also had higher levels of exercise over a one-month period. Findings provide preliminary evidence that, in addition to concurrent self-regulatory efficacy, intergoal conflict, and the likelihood of positive exercise outcomes were related to individuals' future exercise.

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CHAPTER 1

INTRODUCTION

Leisure activities are freely chosen, motivated, goal-directed activities that individuals choose to engage in during their free time (Canadian Index of Wellbeing [CIW], 2010a; Hurd & Anderson, 2011; Veal, 1992). Free time is conceptualized as periods of time when individuals are at their own command and exempt from obligations that they must do for existence (e.g., eat; sleep) and subsistence (e.g., attend work or school; Veal, 1992). Example leisure activities include socializing with family and friends, personal hobbies, and exercising (Hurd & Anderson, 2011). The focus of the present study was on social cognitive factors that were predictive of individuals' engagement in the leisure activity of exercise. Current evidence-based recommendations are that adults, aged 18+ years, should participate in 150+ minutes of moderate to vigorous exercise each week to gain health benefits (Canadian Society for Exercise Physiology [CSEP], 2012; Tremblay et al., 2011). Unfortunately, approximately 80% of Canadian and American adults fail to meet the evidence-based exercise recommendation, while 46% of Canadians and 26% of Americans report being completely inactive (Centers for Disease Control and Prevention [CDC], 2014; Colley et a., 2011; Statistics Canada, 2015).

Interestingly, reports from Canada (Statistics Canada, 2011) and the United States (U.S. Bureau of Labor Statistics, 2016) indicate that over 95% of the adult population engages in some form of leisure activity during their free time on a given day. In both countries, screen time (e.g., watching television) is the most frequently reported leisure activity with people spending the most amount of time engaged in, followed by socializing, and then exercise. Only approximately 20% of adults reported engaging in exercise-related activities during their leisure time. Thus, identifying factors that are predictive of exercise participation is needed.

A number of psychological factors have been examined in the exercise literature that are consistent motivators for exercise adherence (e.g., self-efficacy). Other psychological factors are connected with reasons for not being active (e.g., perceived barriers). Given exercise is a volitional behaviour, individuals' decisions to act in being inactive, irregularly, or regularly active have motivational implications (Bandura, 1986). Investigating psychological factors that may motivate individuals' decision to be active could provide some insight about what motivates decisions to exercise. Further, behavioural decision-making, such as with choosing leisure

activities, does not occur in isolation. Rather, when choosing any one activity to pursue, individuals consider the many things they wish to do in their lives. How do we account for the many considerations and decisions that must be made in order to exercise when individuals may wish to do many other things during their free time? In order to appreciate some psychological factors that may relate to these multiple decisions, including ones to exercise, consideration of background information is instructive.

1.1 Exercise as a Leisure Activity: Not Enough Time?

One of the most commonly reported barriers to exercise in adults is lack of time (e.g., Blackford, Jancey, Howat, Ledger, & Lee, 2013; Cary et al., 2015; Costello, Kafchinski, Vrazel, & Sullivan, 2011; Gierc, Locke, Jung, & Brawley, 2014; Ottenbacher et al., 2011). Could it be that adults have a true lack of time making it difficult to pursue their leisure activities, including exercise? Alternatively, could it be that individuals are choosing to expend their free time engaged in other valued leisure activity pursuits, leaving little or no time to exercise (CIW, 2010a, 2010b)?

Evidence illustrates that the amount of time Canadian adults reported having to participate in leisure activities has remained relatively stable over the last 30 years (Employment and Social Development Canada [ESDC], 2015; Statistics Canada, 2011). Between 1986 and 2010, Canadian adults reported having approximately 330 minutes each day (5 and 1/2 hours) to engage in leisure activities (ESDC, 2015). Canadians seem to have free time to engage in leisure activities on a daily basis, making it plausible that lack of time to exercise is not due to a true lack of time. Rather, individuals may be choosing to engage in other leisure activities, instead of exercise.

Therefore, understanding factors that are predictive of individuals' engagement in exercise, while pursuing other conflicting, concurrent leisure activities was of particular interest in the present study. Given that leisure activities are freely chosen, motivated, and goal-directed behaviours, their regular engagement requires self-regulation (Bandura, 1986). Self-regulation involves individuals exerting control over their behaviour, cognitions, and affect in order to achieve a desired goal when challenges arise (Baumeister, Heatherton, & Tice, 1994). Successful self-regulation requires individuals to: (a) have personally desirable goals, which entail adequate incentives (e.g., outcome expectations, like feeling less tired from doing regular exercise), (b) self-evaluate goal progress, (c) have access to the knowledge and skills necessary for obtaining

goals, and (d) be efficacious in overcoming potential challenges to attainment, termed self-regulatory efficacy (Bandura, 1986; Baumeister et al., 1994).

When individuals fail to exercise but have general or very specific goals (e.g., plans) to exercise, it may be that they are experiencing difficulties in self-regulating their exercise among their goals for doing other valued leisure activities. To appreciate how goals are theorized to play a role in planned leisure activities, the next sections focus on defining goals.

1.2 Goals

According to social cognitive theory (Bandura, 1986), goals are standards of performance that individuals seek to achieve. For example, individuals may set a goal to *exercise on four days a week for 30 minutes each time*. Social cognitive theory (Bandura, 1986) contends that goals may serve a motivational function through a self-regulatory feedback loop. When individuals are committed to achieving a goal, self-evaluative discrepancies between what they hope to achieve and what they actually accomplish result in dissatisfaction. This dissatisfaction serves as a motivator for more effortful future self-regulatory actions to improve progress toward the goal until met.

Characteristics of goals provide insight in terms of how they may help to motivate self-regulatory actions. For goals to serve as motivators, goals should be (Bandura, 1986): (1) specific; (2) challenging yet attainable; and (3) proximal in time. Overall, specific, somewhat challenging, proximal goals function best to motivate people's behaviour across a range of leisure activities, such as exercise, engaging in energy conservation, and cognitive activities (Bandura, 1986; Lunenburg, 2011). Although such goals are ideal, individuals often set and pursue multiple goals at one time (Riediger & Freund, 2004). What happens when people set multiple, concurrent leisure activity goals? A review of concurrent goals, including intergoal conflict and facilitation, may provide some insight.

1.3 Concurrent Goals as Conflicting or Facilitative

Austin and Vancouver (1996) contend that the pursuit of multiple goals should be examined together, rather than in isolation, because goals may interrelate and compete for individuals' self-regulatory resources. Research and social cognitive theory suggest that multiple goals may influence each other in negative (conflicting) or positive (facilitating) ways (Bandura, 1986; Riediger & Freund, 2004). For example, goals to *pursue regular exercise* and *socialize*

with friends may be facilitative of one another. Yet, goals to *pursue regular exercise* and *begin volunteering* may conflict with each other. Given that intergoal conflict and facilitation are conceptualized as separate constructs (Presseau et al., 2010, 2015; Riediger & Freund, 2004), each construct will be outlined independently, followed by a review of relevant literature.

1.4 Intergoal Conflict

Intergoal conflict occurs when an attempt to pursue one goal decreases the likelihood of success in achieving a second goal (Fitzsimons & Bargh, 2004; Riediger, 2001). Social cognitive theory suggests that when concurrent goals conflict, individuals may engage in multiple goal-directed behaviours or they may choose a leisure activity goal to which they will direct limited self-regulatory resources (Bandura, 1986; Fitzsimons & Bargh, 2004). Thus, intergoal conflict may result when the self-regulatory resources of individuals (e.g., time; energy) are divided as they attempt to achieve more than one goal (i.e., resource constraints; Riediger & Freund, 2004). For example, individuals' goals to pursue both *regular exercise* and *volunteer* may compete for the same time.

Intergoal conflict may also result from incompatible goal attainment strategies (Riediger & Freund, 2004). When the method used to pursue one goal cannot be used to pursue a second goal, individuals may have to choose which goal to pursue. For example, goals to *pursue regular exercise* and *play a musical instrument* are unlikely to be pursued by engaging in the same strategies. Theory and research suggest that intergoal conflict may challenge successful concurrent goal management. Specifically, individuals must either manage multiple goal-directed behaviours or engage in active decision-making about which activity to choose.

1.5 Intergoal Facilitation

Intergoal facilitation occurs when an attempt to pursue one goal concurrently increases the likelihood of success in achieving a second goal (Riediger, 2001). Facilitation may result from instrumental relations, where investing effort and other resources into the pursuit of one goal concurrently serves to make progress toward the attainment of another goal (Riediger & Freund, 2004). For example, expending self-regulatory resources to *engage in regular exercise* may generate benefits, such as increased physical endurance, that may generally help to *achieve work-related tasks*. Intergoal facilitation may also result from individuals having overlapping goal-attainment strategies where the same behaviour serves a dual purpose to pursue more than

one goal simultaneously (Riediger & Freund, 2004). For example, a goal *to pursue regular exercise* may also serve goals *to spend time with friends*, while exercising.

When concurrent goals are facilitative, social cognitive theory contends fewer self-regulatory resources should be expended and goals can be more easily managed concurrently (Bandura, 1986). In this case, individuals do not need to actively choose between which leisure activity to pursue.

1.6 Research on Intergoal Conflict and Facilitation in Exercise

Previous exercise studies on intergoal conflict and facilitation have varied in design, with most being cross-sectional or prospective (e.g., Carraro & Gaudreau, 2015; Jung & Brawley, 2010; Karoly et al., 2005; Li & Chan, 2008; McKee & Ntoumanis, 2014; Presseau et al., 2010, 2013; Riediger & Freund, 2004) and one being experimental (Jung & Brawley, 2011). The research has also been mixed between being atheoretical (McKee & Ntoumanis, 2014; Riediger & Freund, 2004), informed by the theory of planned behaviour (Li & Chan, 2008; Presseau et al., 2010, 2013, 2015), and informed by social cognitive theory (Carraro & Gaudreau, 2015; Jung & Brawley, 2010). All of the research has been conducted with adult samples, with most studies being conducted among students (Carraro & Gaudreau, 2015; Jung & Brawley, 2010; Karoly et al., 2005; Li & Chan, 2008; Presseau et al., 2010, 2013).

Overall, this research has corroborated the suggestion that intergoal conflict and facilitation are independent constructs (e.g., Presseau et al., 2010, 2015; Riediger & Freund, 2004). Research has also demonstrated that intergoal facilitation has been *consistently* positively associated with exercise (e.g., McKee & Ntoumanis, 2014; Presseau et al., 2010, 2013; Riediger & Freund, 2004). However, evidence for an intergoal conflict-exercise relationship is less certain. Few studies have shown a significant, negative relationship between intergoal conflict and exercise (Carraro & Gaudreau, 2015; Li & Chan, 2008). In turn, in a recent review, Rhodes and colleagues (2016) concluded that evidence remains inconclusive as of yet in terms of whether a consistent *intergoal conflict-exercise* relationship exists.

There may be at least two methodological limitations within prior research that may explain the inconsistent intergoal conflict-exercise relationship. One limitation may be that participants' self-reported concurrent goals were not sufficiently valued in order to truly conflict with one another. Even though participants were asked to report concurrent goals and, in some cases an associated value, the methodology did not ensure that the goals were *highly* valued (e.g.,

Karoly et al., 2005; Li & Chan, 2008; McKee & Ntoumanis, 2014; Presseau et al., 2013, 2015; Riediger & Freund, 2004). Recall that goals must have adequate incentives in order to be pursued (Bandura, 1986; Baumeister et al. 1994). The current study sought to remedy this issue by implementing a cut-off for goal value to focus the assessment toward highly valued goals.

A second limitation may be that some of the methodology used in previous studies did not target elicitation of goals that specifically *conflicted with exercise* (e.g., McKee & Ntoumanis, 2014). Previously used methods typically asked participants to create a list of concurrent goals that they wished to pursue currently or in the near future (e.g., Li & Chan, 2008; Presseau et al., 2010, 2013, 2015; Riediger & Freund, 2004). Perhaps, there was an inherent assumption by the researchers that the generated list of concurrent goals conflicted with exercise but this was not confirmed. Further, in most studies that explicitly had participants identify goals conflicting with exercise, it was unclear whether subsequent survey measures were specifically designed to focus participants on thinking about concurrently managing *conflicting* goals. Thus, participants may have responded to survey questions without thinking about their conflicting concurrent goals. According to theory, specificity is important in order to increase accuracy and validity of the measurement tools, which in turn may allow more accurate behaviour predictions (Bandura, 1986). To remedy this issue, the current study targeted elicitation of exercise and non-exercise goals that specifically conflicted with one another.

1.7 Self-Regulatory Efficacy and Goal Pursuits

According to social cognitive theory, self-regulatory efficacy beliefs can influence whether individuals' leisure activity goals become realized (Bandura, 1986). Self-regulatory efficacy involves individuals' confidence in their skills and abilities to self-regulate their behaviours, thoughts, or emotions when challenges arise in order to achieve a valued goal (Bandura, 1986; Maddux & Gosselin, 2003). Higher self-regulatory efficacy beliefs are hypothesized to be more beneficial to successful goal achievement. Individuals with higher efficacy tend to persist in their efforts to overcome challenges. In contrast, individuals with lower self-regulatory efficacy lack the persistence needed to overcome challenges. One potential challenge to individuals realizing their leisure activity goals is the simultaneous pursuit of multiple conflicting goals that compete for self-regulatory resources. Individuals' efficacy beliefs to manage concurrent goals are thought to be one salient factor for overcoming such self-

regulatory challenges. These beliefs have been termed concurrent self-regulatory efficacy in the literature and relevant research will be reviewed next.

1.8 Concurrent Self-Regulatory Efficacy Research

Research that has examined concurrent self-regulatory efficacy in the exercise domain is consistent with theoretical contentions (Bandura, 1986). Findings from cross-sectional studies illustrated that concurrent self-regulatory efficacy was significantly higher among those who reported being more frequent exercisers (i.e., met the exercise recommendation) than their less active counterparts (Gierc et al., 2015; Jung & Brawley, 2010). More recently, Crozier and colleagues (2015) illustrated concurrent self-regulatory efficacy was significantly, positively related with current exercise, even when controlling for past exercise. Finally, in an experimental study among working mothers, Jung and Brawley (2011) found mothers with higher concurrent self-regulatory efficacy demonstrated: (1) greater anticipated persistence towards overcoming barriers to exercise goal pursuits; and (2) perceived the concurrent management of valued goals as being more positively challenging than mothers with lower efficacy beliefs.

Two studies prospectively examined concurrent self-regulatory efficacy relative to exercise. Jung and Brawley (2013) examined concurrent self-regulatory efficacy as a potential mediator of the relationship between the value of an exercise goal and future exercise. Notably, this study was conducted when university student participants were experiencing a situation of greater than usual challenge to managing concurrent goals (i.e., final exams and exercise). Findings illustrated that concurrent self-regulatory efficacy was a significant partial mediator at two different time periods during the participants' exam period.

The second prospective study was conducted by Crozier and colleagues (2015) to examine whether concurrent self-regulatory efficacy predicted current (Time 1) and future (Time 2) exercise among first-year university students. Findings indicated Time 1 efficacy beliefs significantly and positively predicted Time 1 exercise. In addition, Time 1 exercise and concurrent self-regulatory efficacy were significant, positive predictors of Time 2 exercise.

Overall, exercise research provides consistent support for the contention that concurrent goal-related cognitions – efficacy beliefs – are related with exercise. Collectively, findings provide convergent evidence of a positive efficacy-exercise relationship.

1.9 Outcome Expectations

According to social cognitive theory, outcome expectations are another mechanism that may be salient to the concurrent self-regulation of leisure activity goals (Bandura, 1986). Outcome expectations can include positive and negative consequences that individuals anticipate may occur as a result of engaging in behaviour. Recall that goal-related pursuits operate motivationally through self-regulatory feedback loops whereby individuals evaluate ongoing behaviour in relation to personal standards regarding desired outcomes (Bandura, 1986). As part of this process, Bandura argues that individuals apply information regarding potential behavioural outcomes (i.e., outcome expectations) when deciding which goals they set and choose to pursue. These outcome expectations can be proximal or distal. Individuals are often motivated by realizing more immediate results and, in turn, proximal outcomes are theoretically more motivating than distal outcomes.

Furthermore, Bandura (1986) contends that outcome expectations consist of two properties: (1) perceived likelihood; and (2) personal value. When individuals believe themselves capable of achieving a favourable outcome that is personally valued (i.e., emotional component) and perceived to be likely to occur (i.e., cognitive component), then it is probable that individuals will choose to pursue the corresponding goal-directed behaviour. Research has mainly investigated positive outcome expectations in the exercise domain (Williams, Anderson, & Winett, 2005). Overall, research has illustrated that individuals are more successful in volitional, exercise goal-related pursuits when positive outcome expectations are perceived to be more personally valued and likely to occur (e.g., Ferrier, Dunlop, & Blanchard, 2010; Heiss & Petosa, 2016). However, research has yet to examine the value and likelihood of positive outcome expectations in predicting exercise when individuals concurrently pursue highly valued and conflicting non-exercise leisure time goals. Thus, the present study extends the research on positive outcome expectations into this particular area.

1.10 Purpose and Hypotheses

Study objectives were to first, remedy some of the methodological limitations of previous concurrent intergoal conflict-exercise research and second, extend the research by examining outcome expectations in relation to concurrent goals. To address the potential lack of assessment of highly valued, conflicting goals in prior research, participants in the present study had to

report exercise and non-exercise goals that were valued above a cut-off illustrative of being highly valued. To address the second limitation that prior research may not have elicited a non-exercise goal that specifically conflicted with exercise, participants in the present study responded to survey measures that explicitly instructed them to think about their exercise and non-exercise goals that conflicted with each other when responding to the measures.

The specific study purpose was to examine whether intergoal conflict and the likelihood and value of positive exercise outcome expectations predicted moderate-vigorous exercise beyond concurrent self-regulatory efficacy when concurrent conflicting goals were highly valued. Given that the study examined individuals' exercise participation while concurrently pursuing highly valued and conflicting exercise and non-exercise leisure time goals, several hypotheses were advanced about Time 1 variables predicting Time 2 exercise. Based upon theory (Bandura, 1986) and consistency of past research findings:

(1) Time 1 concurrent self-regulatory efficacy was expected to significantly predict Time 2 exercise (e.g., Crozier et al., 2015; Gierc et al., 2014; Jung & Brawley, 2010, 2011, 2013).

(2) Time 1 intergoal conflict and positive exercise outcome expectations (likelihood and value) were expected to contribute to the prediction of Time 2 exercise by independently accounting for significant, additional variance.

(3) The direction in which the predictors contribute were expected to be as follows. Exercise would be negatively predicted by intergoal conflict (e.g., Carraro & Gaudreau, 2015; Li & Chan, 2008) and positively predicted by concurrent self-regulatory efficacy (e.g., Crozier et al., 2015; Jung & Brawley, 2013), and the likelihood and value of outcome expectations.

CHAPTER 2

METHODS

The study was approved by the University of Saskatchewan's Behavioural Research Ethics Board.

2.1 Participants

To be eligible to participate, individuals were required to:

1. Be Canadian or American adults, aged 18+ years.
2. Be English reading in order to complete the online surveys.
3. Have engaged in self-reported moderate-vigorous exercise for at least one bout of 20+ continuous minutes in the past month.
4. Have plans to pursue a highly valued exercise goal for at least one bout of 20+ continuous minutes during the next month.
5. Have plans to pursue a highly valued and conflicting non-exercise, leisure time goal for at least one bout of 20+ continuous minutes during the next month.
6. Be free of any self-reported health restrictions that would have prevented leisure time pursuits in the next month.

Requiring individuals to report: (1) a highly valued exercise goal and highly valued conflicting non-exercise goal for the near future; and (2) engaging in exercise in the near past ensured that participants had the experiential basis to accurately respond to the social cognitive measures (Bandura, 1986). For criteria 4 and 5, a highly valued goal was defined as individuals reporting a minimum of 6 on a goal value response scale that ranged from 1 (*I do not value this goal at all*) to 9 (*I value this goal very much*). This was to ensure examination of concurrent goals that were highly valued and, according to theory, more likely to be conflicting and require self-regulation for their successful concurrent pursuit (Bandura, 1986).

Overall, 87 adult participants (M_{age} = 31.67 ± 10.90 years) completed the Time 1 and 2 surveys. Eighty-four participants (97%) resided in Canada, while the remainder resided in the United States of America. Seventy-three (84%) were white and female, respectively. Approximately 65% of the sample had an annual household income of $50,000 or more, while 64% also held at least a university bachelor's degree. The sample's marital statuses were mixed,

with most being married (41%), single (22%), or single, but living with a partner (22%). Based on self-reported height and weight, participants' mean body mass index (BMI) was 24.04 ± 4.83 kg/m^2.

2.2 Measures and Study Design

The study used a prospective web-based design, with online survey measures being given at Time 1 and one month later at Time 2. All measures are included in Appendix A.

2.2.1 Demographics

Descriptive information on age, gender, race, total annual household income, education, marital and employment statuses, height, and weight was collected. Height and weight were used to calculate self-reported BMI.

2.2.2 Goals

Consistent with the literature, an elicitation approach was used to obtain participants' personal goals (e.g., Jung & Brawley, 2010, 2013; Karoly et al., 2005; Li & Chan, 2008; McKee & Ntoumanis, 2014; Riediger & Freund, 2004). First, goals were defined as "*objectives/ outcomes that we try to achieve by doing a behaviour ... We would like you to focus only on identifying the goals that you make plans to achieve in advance during your free time.*" Similar conceptualizations of goals have been used in previous research to ensure elicitation of participant-specific goals that require self-regulation (Jung & Brawley, 2010, 2013). After reading the definition of goals, participants were prompted to list their *most highly valued* exercise and *conflicting* non-exercise, leisure activity goals that they wished to achieve in their free time during the following month. A one-month duration was specified to have participants focus on specific versus global goals (i.e., goal proximity; Austin & Vancouver, 1996; Bandura, 1986; Cervone, Mor, Orom, Shadel, & Scott, 2004).

Similar to prior research, participants rated the value of each respective goal on a 1 (*I do not value this goal at all*) to 9 (*I value this goal very much*) Likert scale (Jung & Brawley, 2010, 2013; McKee & Ntoumanis, 2014). Recall that to be included in the study, participants needed to rate both of their goals as being highly valued, defined as ≥ 6 on the Likert scale. This value fell above the midpoint of the response scale, which may be illustrative of goals that were highly valued. Participants were instructed to think about their highly valued, conflicting non-exercise

goal when responding to all subsequent questions regarding the concurrent management of their goals.

2.3.3 Intergoal conflict

Intergoal conflict for the upcoming month was measured using the intergoal conflict subscale of the Intergoal Relations Questionnaire (IRQ; Riediger & Freund, 2001, 2004). Participants responded to 4 items that captured intergoal conflict due to: (a) time constraints, (b) financial constraints, (c) energy constraints, and (d) incompatibility of goal attainment strategies. Example items include: "*How often can it happen that, because of the pursuit of your important non-exercise goal, you do not invest as much time into your exercise goal as you would like to?*" and "*How often can it happen that you do something in pursuit of your important non-exercise goal that does not help you to achieve your exercise goal*." Participants responded to each item on a 1 (*very rarely/never*) to 5 (*very often/always*) Likert scale, where higher scores signify greater conflict between the participants' concurrent goals.

While the intergoal conflict subscale has demonstrated acceptable reliability in prior research (Cronbach's alpha ≥ .73; McKee & Ntoumanis, 2014, Riediger, 2001, Riediger & Freund, 2004), the subscale had unsatisfactory reliability in the present study (Cronbach's alpha = .61). Typically, an acceptable reliability is conceptualized as being a Cronbach's alpha value of at least .70 (Nunnally & Bernstein, 1994; Tabachnick & Fidell, 2012). Since the reliability of the subscale remained unacceptable if any item was deleted, one item was selected to represent intergoal conflict. This item was "*How often can it happen that you do something in pursuit of your important non-exercise goal that does not help you to achieve your exercise goal*." This item was deemed to be most representative of participants' perception of intergoal conflict on a broad level (i.e., face validity), particularly in comparison to the other subscale items that asked about conflict due to time, finances, and energy (Fuchs & Diamantopoulos, 2009).

2.3.4 Concurrent self-regulatory efficacy

Participants' confidence in their abilities to concurrently regulate their exercise and non-exercise goals was assessed using a scale from previous research (e.g., Crozier et al., 2015; Gierc et al., 2014; Jung & Brawley, 2010, 2011, 2013). Participants were first directed to think about "*managing your most important (valued) exercise and non-exercise goals concurrently (at the same time) over the next month (4 weeks).*" Participants then rated their confidence to engage in

five different self-regulatory behaviours in order to manage *both* of their goals during a typical week in the next month. Example items include: "*How confident are you in your ability to make up for any missed sessions for both your exercise and important non-exercise goal during a typical week?"* and "*How confident are you in your ability to accurately monitor your time so that you are able to make progress towards both your exercise and important non-exercise goal during a typical week?"*

Adhering to Bandura's (1997, 2006) recommendations, participants responded to the five items on a 0 (*not at all confident*) to 10 (*extremely confident*) Likert scale. An average efficacy score for each participant was calculated, with higher scores representing higher efficacy beliefs. The measure has demonstrated predictive validity and acceptable reliability in previous studies, where Cronbach's alphas were ≥ .90 (e.g., Crozier et al., 2015; Gierc et al., 2014; Jung & Brawley, 2010, 2011, 2013; Tabachnick & Fidell, 2012). The scale demonstrated acceptable reliability in the present study (Cronbach's α = .84; Tabachnick & Fidell, 2012).

2.3.5 Positive exercise outcome expectancies (likelihood and value)

Positive, proximal outcomes expected as a result of doing moderate-vigorous exercise in the next month, were self-reported via an open-ended elicitation method. Participants read the stem "*Pursuing moderate-vigorous exercise in the next month (4 weeks) will…"* before listing up to five positive outcomes.

In line with theoretical contentions, participants rated the likelihood of occurrence (i.e., cognitive component) and associated personal value (i.e., emotional component) of each expected outcome over the ensuing month (Bandura, 1986). Outcome likelihood was rated on a 1 (*very unlikely*) to 9 (*very likely*) Likert scale. Outcome value was rated on a 1 (*not valuable at all to me*) to 9 (*very valuable to me*) Likert scale. Similar outcome expectation assessment protocols have been used in previous exercise research among adult populations (e.g., Gyurcsik et al., 2011, 2015). Participants' scores were averaged for each of likelihood and value. The denominator for each mean calculation was the total number of outcomes that each participant reported. Higher scores represented that outcomes were more likely to occur and more valued.

2.3.6 Exercise.

The total amount of weekly moderate-vigorous exercise that participants engaged in during a typical week in the past month was assessed using modified exercise questions from the

Behavioral Risk Factor Surveillance System (BRFSS; Centers for Disease Control and Prevention [CDC], 2013). Acceptable reliability of the original measure has been established in healthy adult samples (Helmerhorst, Brage, Warren, Besson, & Ekelund, 2012). The measure also demonstrated convergent validity with objective exercise measures (e.g., accelerometry; Helmerhorst et al., 2012).

As in previous exercise research with adults, the BRFSS questions were modified to specifically capture *planned moderate and vigorous exercise bouts* in the present study (e.g., Cary, Gyurcsik, & Brawley, 2015; Flannery, Burket, & Resnick, 2014; Gyurcsik et al., 2015; Kwon, Wang, & Hawkins, 2016). The modification focused participants to report only moderate-vigorous exercise bouts that lasted for 20+ minutes. The original measure also assessed (a) light exercise and (b) any duration of any intensity (versus 20 minutes in the present study). The focus on moderate-vigorous exercise in the present study ensured consistency with the current Canadian Society for Exercise Physiology (CSEP) exercise guidelines (Tremblay et al., 2011). The focus on planned exercise bouts of 20+ minutes requires self-regulation, unlike incidental, unplanned exercise bouts. In addition, theory contends that the motivational incentives connected with exercise outcome expectations are associated with longer, planned exercise bouts (i.e., behaviours requiring self-regulation) as opposed to shorter, incidental bouts (Bandura, 1986). Longer, planned bouts are also more accurately recalled and self-reported than incidental bouts (Cust et al., 2008; Matthews et al., 2005).

Participants self-reported the average frequency (i.e., number of days/week) and duration (i.e., amount of time/day) of both moderate and vigorous exercise bouts that they engaged in for ≥ 20 minutes during a typical week over the past month. Before completing the measure, definitions of both moderate and vigorous exercise were provided to participants (CSEP, 2012). Similar definitions have been used in previous exercise research among adults (e.g., Cary, Gyurcsik, & Brawley, 2015; Gyurcsik et al., 2011, 2013, 2015; Sessford et al., 2015). The definition of moderate exercise read:

> ***"****Moderate exercise makes your heart beat faster and makes you breathe a little harder. You can easily talk while doing moderate exercise, but you may not be able to sing comfortably. Intensity can be estimated using a scale from 0 to 10, where sitting is 0 and 10 is the highest level of effort possible. Moderate intensity exercise would be a 5 or 6."*

The definition of vigorous exercise read:

> *"Vigorous exercise makes your heart beat much faster. You may not be able to talk comfortably without stopping to catch your breath. Intensity can be estimated using a scale from 0 to 10, where 0 is sitting and 10 is the highest level of effort possible. Vigorous intensity exercise would be a 7 or 8."*

Total weekly exercise volume was calculated by summing a participant's total amount of moderate exercise (frequency × duration) and vigorous exercise (frequency × duration). As an example, a participant would have a total exercise volume of 195 minutes, if the individual reported three days of moderate exercise for 45 minutes/day and two days of vigorous exercise for 30 minutes/day [(3 x 45) +(2 x 30)].

2.3 Procedures

A target sample size was determined *a priori* based upon Green's (1991) rule-of-thumb when conducting a multiple regression analysis. The analysis was expected to be conducted with 4 predictors and a medium effect size at $p < .05$, which is typically found in psychological research (Cohen, 1988; Green, 1991). In turn, the analysis would require complete data on 81 individuals. However, past research indicated a dropout rate of approximately 20% should be expected in prospective social cognitive exercise research (i.e., two-week to two-month study durations; e.g., Cary, 2014; Crozier et al., 2015; Gyurcsik et al., 2011). Accordingly, over-sampling was planned at Time 1 to obtain a minimum target of 102 individuals which, with 20% dropout, would yield a final sample size of 81 participants.

Participants were recruited using various strategies including: (a) emailing study announcements to leisure and health-related organizations across Canada for distribution to their network; (b) distributing study announcements in-person to community leisure programs, health-related organizations and across a university campus; (c) social media postings (e.g., Facebook; Twitter); and (d) online bulletin postings (e.g., university-based online announcement services; Kijiji). Recruitment materials (see Appendix B) outlined the study purpose and procedures and contained a link to the Time 1 online survey (hosted by FluidSurveys).

Upon accessing the link, interested individuals were presented with an informed consent form (see Appendix C). Individuals who provided electronic consent, then completed participant inclusion criteria questions (see Appendix D). Individuals who did not meet the inclusion criteria were thanked for their interest and then exited from the survey.

Individuals who met the inclusion criteria were then asked to provide their email address for the purposes of survey tracking and to send reminder emails regarding the Time 2 online survey. Then, individuals completed the remainder of the Time 1 survey that assessed: (a) demographics; (b) intergoal conflict; (c) concurrent self-regulatory efficacy; and (d) positive exercise outcome expectation likelihood and value (see Appendix A for the measures). The Time 1 survey took approximately 25 minutes to complete. Upon completion, participants were thanked for their time and reminded that they would be receiving a link to the Time 2 survey.

One month later, participants were emailed a link to the Time 2 online survey that assessed self-reported exercise over the previous month. The Time 2 survey took approximately 5 minutes to complete. To promote study adherence, participants who failed to complete the Time 2 survey within 24 hours of being emailed the link were sent a reminder email the subsequent day, reminding them to complete the survey. This follow-up strategy was successful in achieving an 80.6% study adherence rate. Overall, 108 individuals completed the Time 1 survey, while 87 individuals completed the Time 2 survey. Study adherers and dropouts are discussed further in the results section.

2.4 Data Management and Analyses

Version 24 of the Statistical Package for the Social Sciences (SPSS) software was used for data analyses. First, data were screened for missing values, outliers, and normality. Recommendations from Tabachnick and Fidell (2012) were followed for handling issues regarding missing data, outliers, and normality violations. Missing item response values were replaced with the participant's mean score for each respective measure. An exception to this substitution was made for the exercise measure, where some participants reported exercise days, but not minutes, or vice versa. For each case, a conservative substitution approach was taken, where the minimum value possible (i.e., 1 day or 20 minutes) was used. This approach matched the exercise directions from which participants affirmed completing at least one 20-minute moderate-vigorous exercise bout. Missing data for each measure were random and minimal (< 10%), which is acceptable (Tabachnick & Fidell, 2012).

If a participant did not respond to an entire scale, the sample mean for the scale was substituted (Tabachnick & Fidell, 2012). Outliers were identified as having a z-score ≥ 3.29 (Tabachnick & Fidell, 2012). Outliers were handled by changing the score to one unit higher (lower) than the next highest (lowest) reported value for the measure (Tabachnick & Fidell,

2012). This method of outlier transformation is conservative in that it does not change the rank of individual participants, yet promotes a more normal distribution.

After correcting for outliers, the distributions of exercise outcome expectation likelihood and exercise data were still non-normally distributed (i.e., $z_{skewness}$ or $z_{kurtosis} \geq |2|$; Tabachnick & Fidell, 2012). Likelihood was negatively skewed and leptokurtic, while exercise was positively skewed. Further transformations to the distributions of these variables were not conducted for several reasons. First, when considering the current sample of individuals who were pursuing highly valued exercise goals, social cognitive theory contends that high positive exercise outcome expectation likelihood is an expected characteristic (Bandura, 1986). Second, the slight positive skewness and high variability in the exercise data were reflective of the nature in which exercise may naturally occur among exercisers in the healthy adult population. Specifically, the skewness in exercise seemed consistent with individuals who were exercising, which was a requirement for study participation. Further, the large variability seems to be representative of highly variable exercise trends currently observed in research among healthy adults (e.g., Jung & Brawley, 2010, 2013; Presseau et al., 2013). Finally, it was recognized that proceeding with non-normally distributed variables may have posed a violation to the normality assumption of parametric statistical analyses, including the primary study analysis (i.e., hierarchical multiple regression).

Hierarchical multiple regression, however, is very robust (Cohen et al., 2003) to such violations and multiple regression does not assume normal distributions of the independent or dependent variables. Rather, normal distribution of the *residuals* of the model is assumed. Thus, regression models are less affected by univariate normality violations compared to residual normality violations. Other assumptions for a multiple regression analysis were checked and satisfied (e.g., subject-independent variable ratio; relationship linearity; bivariate outliers; multicollinearity; normality and homoscedasticity of residuals; Cohen et al. 2003; Tabachnick & Fidell, 2012).

The results section includes four main sections. The first two sections present an investigation of differences between study adherers and dropouts (i.e., MANOVAs for continuous demographic and primary study variables; chi-square tests for categorical demographics) and descriptive statistics (i.e., means and standard deviations) of the primary

study variables. The third section presents the results of Pearson bivariate correlation analyses between the primary study variables entered in the hierarchical multiple regression analysis.

The fourth section presents the primary data analysis, a three-step hierarchical multiple regression predicting Time 2 exercise. Order of entry into the model followed Cohen and colleagues (2003) suggestion for "least evidence is last." Meaning that, after controlling for covariates in an initial step, primary predictor variables should be subsequently entered in order of strongest to weakest evidence for their relationship with the outcome variable. Thus, step one controlled for demographic covariates that were found to have significant bivariate correlations with Time 2 exercise. Then, the primary study variable with the strongest evidence for the relationship with exercise – concurrent self-regulatory efficacy – was entered in step two (e.g., Crozier et al., 2015; Gierc et al., 2014; Jung & Brawley, 2010, 2013). Step three included intergoal conflict and the likelihood and value of positive exercise outcome expectations.

CHAPTER 3

RESULTS

3.1 Comparing Study Adherers and Dropouts

One hundred and eight participants completed the Time 1 survey, with 87 completing the Time 2 survey. Study adherers (n = 87) and dropouts (n = 21) were compared on all demographics and primary study variables measured at Time 1. For detailed demographic and primary variable information of the two groups, please see Appendix E. Results of group difference analyses indicated study adherers and dropouts only significantly differed in the categorical demographic of race; $\chi^2 = 7.43$, $p = .02$. Examination of frequency differences (see Table F.1) suggested that minority races tended to dropout.

All of the remaining results presented in the following sections pertain to the final sample size of 87 participants who were study adherers.

3.2 Descriptive Statistics of Primary Study Variables

Descriptive statistics of primary study variables are presented in Table 3.1. Participants reported that their non-exercise goal was highly valued (*mean value* = 8.39) as was their exercise goal (*mean value* = 7.64). Recall that the minimum cut-off for study participation was a value of 6. Elicited non-exercise goals were most frequently related to maintaining interpersonal relationships (i.e., socializing), followed by finishing work- or school-related tasks at home, then pursuing hobbies. Participants' elicited exercise goals were predominantly frequency, performance, and scheduling related. See Appendix F for a summary of participants' exercise and non-exercise goals. Participants also reported moderate intergoal conflict and being slightly more than moderately confident to concurrently manage both of their goals over the next month. Individuals perceived that their positive exercise outcome expectancies were highly valued and likely to occur in the next month. For a summary of participants' outcome expectations, please see Appendix G. Participants' mean total exercise volume at Time 2 was above the recommended weekly amount. Further, most participants (67%; n = 58) reported meeting the current Canadian exercise recommendation. On average, participants reported exercising on 5.89 days (SD = 2.63) during a typical week for 41.81 minutes (SD = 35.94) per day.

Table 3.1
Descriptive Statistics of the Primary Study Variables (n = 87)

Variable	*Adherers* *M* (*SD*)
Non-exercise goal value	8.39 (0.91)
Exercise goal value	7.64 (1.02)
Intergoal conflict	3.08 (0.96)
Concurrent self-regulatory efficacy	6.26 (1.59)
Positive outcome expectancy likelihood	7.70 (0.90)
Positive outcome expectancy value	8.00 (0.82)
Time 2 exercise	228.63 (166.58)

Note. Measures had the following response ranges: (1) non-exercise and exercise goal value were 1 (*I do not value this goal at all*) to 9 (*I value this goal very much*); (2) intergoal conflict was 1 (*very rarely/never*) to 5 (*very often/always*); (3) concurrent self-regulatory efficacy was 0 (*not at all confident*) to 10 (*extremely confident*); (4) positive outcome expectancy likelihood was 1 (*very unlikely*) to 9 (*very likely*); (5) positive outcome expectancy value was 1 (*not valuable at all to me*) to 9 (*very valuable to me*); and (6) Time 2 exercise was a total volume calculated by summing the frequency and duration of moderate and vigorous exercise bouts (*minutes per week*).

3.3 Correlations Between Primary Study Variables

Pearson bivariate correlation analyses were conducted between the primary study variables. Results are presented in Table 3.2. Time 2 exercise was significantly correlated with each of the Time 1 primary variables.

Table 3.2
Correlation matrix of primary study variables in hierarchical multiple regression (n = 87)

	1	2	3	4	5
1. Intergoal conflict	-				
2. Concurrent self-regulatory efficacy	-.21	-			
3. Positive outcome expectancy likelihood	-.08	.14	-		
4. Positive outcome expectancy value	.02	.19	.40**	-	
5. Time 2 exercise	-.29**	.30**	.35**	.22*	-

Note. *$p < .05$; **$p < .01$.

3.4 Predicting Time 2 Exercise

Table 3.3 presents the results from the hierarchical multiple regression predicting Time 2 exercise from Time 1 covariates and social cognitions. Recall the analytic plan was to enter: (a) significant demographic covariates in step 1; (b) concurrent self-regulatory efficacy in step 2; and (c) intergoal conflict and positive outcome expectancy likelihood and value in step 3.

Participants' age and total annual household income, which were the only demographics that were significantly correlated with Time 2 exercise, were entered as covariates in step 1. Age was the lone significant predictor, accounting for 9% of the variance; F (2, 84) = 3.90, p = .02.

Adding concurrent self-regulatory efficacy in step 2 resulted in a significant model; F (3, 83) = 5.35, p = .002. Efficacy accounted for an additional 8% of the variance in Time 2 exercise (p = .007). Age and concurrent self-regulatory efficacy were significant independent predictors.

The addition of intergoal conflict and positive outcome expectations in Step 3 accounted for an additional, significant amount of variance in Time 2 exercise (R^2_{change} = 13, p = .004). The full model was significant, F (6, 80) = 5.48, p < .001. As seen in Table 3.3, concurrent self-regulatory efficacy (t [80] = 1.99, p = .05), intergoal conflict (t [80] = -2.39, p = .02), and the likelihood of outcome expectations (t [80] = 2.63, p = .01) were significant predictors of Time 2 exercise. All predictors demonstrated small to medium effect sizes (see β values, as well as squared semi-partial coefficients in Table 3.3; Cohen, 1992, 1988; Cohen et al., 2003; Field, 2005; Tabachnick & Fidell, 2012). Results from the final model illustrated that participants who reported higher concurrent self-regulatory efficacy, lower intergoal conflict, and higher positive outcome likelihood, also reported higher levels of Time 2 exercise.

Table 3.3
Prediction of Time 2 Exercise (n = 87)

Predictor	R^2_{adj}	ΔR^2	β	sr^2
Step 1	.06*	.09*		
Age			.23*	.05*
Total Annual Household Income			.13	.01
Step 2	.13**	.08**		
Age			.22*	.04*
Total Annual Household Income			.12	.01
Concurrent self-regulatory efficacy			.28**	.08**
Step 3	.24**	.13**		
Age			.20	.03
Total Annual Household Income			.11	.01
Concurrent self-regulatory efficacy			.20*	.03*
Intergoal conflict			-.23*	.05*
Positive outcome expectancy likelihood			.27**	.06**
Positive outcome expectancy value			-.01	.00

Note. *p < .05; **p < .01.

CHAPTER 4

DISCUSSION

4.1 Introduction to the Discussion

Eighty percent of Canadians fail to meet the evidence-based exercise recommendations (Colley et al., 2011) and 46% report being completely inactive (Statistics Canada, 2015). Perplexingly, Canadian adults commonly report they do not have enough time to exercise (e.g., Blackford et al., 2013; Cary et al., 2015; Gierc et al., 2014), yet they have approximately 330 minutes each day to engage in leisure activities (ESDC, 2015). Further, recent statistics indicate most adults report participating in leisure activities on a given day (Statistics Canada, 2011; U.S. Bureau of Labor Statistics, 2016). One plausible explanation is that individuals may be pursuing other leisure activities that conflict with exercise participation. In turn, among individuals who have plans to exercise, but fail to do so, they may be experiencing difficulties in self-regulating their exercise among their other valued leisure activities (Bandura, 1986). Thus, identification of psychological factors that reflect self-regulation and are predictive of exercise participation is needed.

The study purpose was to examine whether Time 1 intergoal conflict and positive exercise outcome expectations (likelihood and value) significantly predicted Time 2 exercise (four weeks later) beyond the variance accounted for by concurrent self-regulatory efficacy. The three-step hierarchical multiple regression analysis illustrated that adding intergoal conflict and outcome expectations to the regression model accounted for an additional and significant 13% of the variance in exercise.

In the full model, concurrent self-regulatory efficacy, intergoal conflict, and positive outcome likelihood were significant predictors of exercise and demonstrated small to medium effect sizes. These findings supported the study hypotheses. However, contrary to hypotheses, the value of outcomes was not a significant predictor. Each of these findings is discussed in greater detail below.

4.2 Intergoal Conflict

Previous research has been inconclusive about whether a significant relationship exists between intergoal conflict and exercise (Rhodes et al., 2016). The present study tried to improve upon potential methodological limitations in past research by implementing better measurement specificity of intergoal conflict (Bandura, 1986). The methodology attempted to ensure that both of the participants' conflicting exercise and non-exercise goals were *highly valued* (i.e., 6 or higher on a 1 to 9 response scale). Second, participants were instructed to think about both of their *conflicting* goals when answering all of the Time 1 survey measures.

Findings from the hierarchical multiple regression analysis illustrated that when these methodological remedies were applied, intergoal conflict did predict exercise. This finding is among the first to demonstrate that intergoal conflict significantly, negatively predicts exercise (e.g., Carraro & Gaudreau, 2015). A theoretically-based speculation for this predictive relationship is that those who perceive higher levels of conflict between two concurrent goals should have less successful behavioural self-regulation, such as exercise engagement (Bandura, 1986). However, verification through a causal demonstration in future research is necessary.

Despite the methodological improvement in assessing conflicting goals, the internal consistency of the intergoal conflict measure was a concern in the present study. Recall that the Cronbach's alpha value of the full four-item conflict scale was .61 and removal of any item did not improve the alpha value. It is important to recognize that no gold standard cut-off value of an acceptable Cronbach's alpha coefficient currently exists (Clark & Watson, 1995; Cortina, 1993). Suggestions have been made that Cronbach's alphas of .60 may be deemed satisfactory (Nunnally, 1967) and acceptance of this value is becoming less rare in research studies (Clark & Watson, 1995; Henson, 2001). However, typical practice in the literature is a minimum cut-off of .70 in order for a scale to be deemed acceptably reliable (Lance, Butts, & Michels, 2006; Nunnally & Bernstein, 1994; Osborne, 2014; Tabachnick & Fidell, 2012). This typical cut-off should not be confused with a universal standard (Lance et al., 2006). Rather, determination of a satisfactory level of reliability is dependent on how a given measure is used (Cortina, 1993; Nunnally & Bernstein, 1994). In this regard, a Cronbach's alpha $\geq .70$ has been argued for early stages of psychology research examining predictive validation of a measure (Nunnally & Bernstein, 1978, 1994).

Considering the latter argument, the reliability of the four-item intergoal conflict subscale in the current study was deemed unacceptable. As a result, a decision was made to use a single item that seemed to best represent the overall concept of intergoal conflict. The remaining three items concerned conflict due to specific types of constraints including time, finances, and energy. Such factors may not have been salient to the majority of the sample. For example, 50% of the sample reported a household income of $70,000 or more, which could negate or nearly negate the potential conflict related to finances.

Considering that study findings contributed evidence of a significant negative intergoal conflict-exercise relationship, future research is warranted to: (1) determine if study findings can be replicated; and (2) improve the psychometric characteristics of intergoal conflict measurement (i.e., reliability). Specific future directions are addressed later in the discussion.

4.3 Concurrent Self-Regulatory Efficacy

The finding of a significant, positive relationship with exercise provided convergent evidence with previous cross-sectional and prospective research in the exercise domain (e.g., Crozier et al., 2015; Gierc et al., 2014; Jung & Brawley, 2010, 2011, 2013). The findings from the present study were also in line with contentions from social cognitive theory (Bandura, 1986) that individuals who have higher levels of confidence to concurrently manage multiple highly valued, conflicting exercise and non-exercise goals should also have higher exercise participation.

4.4 Positive Exercise Outcome Expectations

The present study was the first to examine positive outcome expectations within the concurrent goals and exercise domain. Findings from the regression analysis illustrated that the likelihood of positive outcome expectations was a significant positive predictor of Time 2 exercise. Participants who reported higher likelihood also had higher exercise participation. This finding is also consistent with previous research that examined positive outcome expectations in the exercise domain among adult samples (e.g., Ferrier et al., 2010; Heiss & Petosa, 2016).

In contrast, the value of outcome expectations was not a significant predictor of exercise in the current study. One plausible explanation is that study participants, who were predominantly regular exercisers (i.e., 67% met the exercise recommendation of 150+ minutes of moderate-vigorous exercise per week), reported a near ceiling effect in value with low variability. The mean value score was 8 on a 1 (*not valuable at all to me*) to 9 (*very valuable to me*) scale

and the standard deviation was 0.82, which was the smallest across all of the study measures (see Table 3.1). The high mean and low variability in participants' outcome expectancy value scores makes sense in relation to social cognitive theory contentions (Bandura, 1986). That is, those who are already pursuing a volitional behaviour regularly, such as exercise, should consistently personally value the outcome(s) that are expected to occur as a result of doing so. In contrast, outcome likelihood was somewhat lower (M = 7.70) and had more variability (SD = 0.90), which may be expected given that exercise challenges may arise which decrease the perceived likelihood of achieving outcomes. Further, the low variance in outcome value did not match the higher variance in exercise and limited the ability for value to predict Time 2 exercise (Goodwin & Leech, 2006).

4.5 Strengths

Researchers have seldom recognized that the pursuit of a highly valued exercise goal does not occur in isolation (Austin & Vancouver, 1996; Jung, 2008). The present study contributed new information to the limited research on concurrent goals in the exercise domain. The study was the first to examine outcome expectancies within the concurrent goal and exercise domain and was the first to examine the relationship of intergoal conflict with exercise under more stringent study conditions.

The use of social cognitive theory as a framework was a study strength. An advantage of conducting theory-driven research is that researchers have a basis for understanding and explaining both significant and non-significant predictive relationships, which can then direct enhanced future investigations (Brawley, 1993). In addition, the theoretical basis of the current study answered a call for further investigation of other malleable theory-based cognitions, in addition to concurrent self-regulatory efficacy (Jung, 2008).

Given the predominant regular exerciser sample, the demonstration of significant small to medium effect sizes in the hierarchical multiple regression model was a study strength. According to social cognitive theory, individuals who have more mastery experience with self-regulating their exercise are also more likely to be characterized by more stable social cognitions towards exercise (Bandura, 1986). In turn, it is thought that when individuals pursue exercise regularly, their continued engagement may become more out of habit than motivated by cognitive factors until their behaviour is challenged. Thus, the presence of a highly valued conflicting non-exercise goal may have sufficed to capture a challenging situation for the sample.

Clearly, given theoretical contentions, large effect sizes would not have been expected, but finding small to medium effects was noteworthy. Further, these significant effect sizes were also detected despite the possibility that the current study may have been underpowered with the addition of covariates in the overall model. In this regard, Green (1991) argues that 97 participants would be needed to conduct the current multiple regression analysis with 6 predictors to detect medium effect sizes at $p < .05$, while the current study had 87 participants.

The methodology used to identify conflicting exercise and non-exercise goals was a study strength. The current study addressed limitations of previous research and made novel contributions to the literature by ensuring participants' elicited exercise and non-exercise goals were both: (1) highly valued; and (2) explicitly affirmed to be conflicting in nature (Bandura, 1986). This specificity took into account participants' perceptions of their intergoal relations. In addition, rather than assuming non-exercise goals must be conflicting in nature with participants' exercise goals, the present study allowed participants to identify the perceived nature of intergoal relation (i.e., they identified the non-exercise goal as conflicting with their exercise goal). Finally, examination of concurrent goals that were solely conflicting in nature partially addressed a call made for future prospective research with more controlled designs focusing on independent measurement of intergoal conflict and facilitation (Jung & Brawley, 2010).

4.6 Limitations

The current study was not without limitations. Generalizability of the findings are limited due to the sample being primarily white, educated, middle-upper class, females who had access to a computer to complete the online surveys and who had sufficient health and leisure time available to pursue their goals. Findings may not be upheld in more varied, representative samples of the healthy adult population. For example, adults who are socially disadvantaged (e.g., low socioeconomic status; racial minorities) may have worse health than their socially advantaged counterparts (Alter, Stukel, Chong, & Henry, 2009; Mikkonen & Raphael, 2010). Such individuals may also spend more time pursuing activities that are necessary for existence and/or subsistence (e.g., multiple part-time jobs), leaving less time available for leisure pursuits. The larger public health domain program should continue to investigate strategies to help address social determinants that contribute to people being socially disadvantaged. Once disadvantages are attenuated, then perhaps these individuals may also have adequate health, time, and opportunity to engage in leisure activities.

Despite varied recruitment attempts, the sample was relatively active, with the majority of participants meeting the exercise recommendation. Findings are specific to adults who were doing longer bouts (20+ minutes) of planned moderate-vigorous intensity exercise. Findings may not be generalizable to those who are: (1) participating in incidental and/or light exercise; and (2) exercising for shorter bouts (< 20 minutes). In addition, an exercising sample may indicate that participants were rather effective at self-regulating their concurrent exercise and conflicting non-exercise goals. Collectively, the implication is that current findings may be specific to exercisers who have some mastery experiences, and in turn, more positive concurrent goal-related cognitions (Bandura, 1986). Findings may not be consistent for samples of less active individuals who are learning to successfully self-regulate exercise among their other highly valued, conflicting concurrent leisure goals. Examining concurrent goal-related cognition-behaviour relationships among these individuals may be a direction for future research that will be discussed in the next section.

The low reliability of the intergoal conflict measure also presented a study limitation. Although the measure demonstrated acceptable internal consistency in previous research (e.g., McKee & Ntoumanis, 2014; Riediger, 2001; Riediger & Freund, 2004), the Cronbach's alpha value in the current study was low. As a result, the measure was reduced to a single-item. Given the current concerns regarding the reliability and saliency of the conflict items of the IRQ (see the measures and earlier discussion sections), the reduction to a single-item measure was most appropriate to assess participants' perceptions of intergoal conflict on a broad level. Further, arguments have been made that one good item can provide a better assessment of overall, broad psychological constructs than many misfitting or misrepresentative items (e.g., Fuchs & Diamantopoulos, 2009). Single-item measures may also help to reduce measurement error-related issues in regression analyses (Cohen et al., 2003). Moving forward, however, it should be recognized that single-item measures have their own limitations. For example, the internal consistency coefficient cannot be directly computed and the measure could be susceptible to unknown measurement error and bias (Nunnally & Bernstein, 1994). Thus, further investigation to identify reliable and valid measures of intergoal conflict is needed. Relevant future directions are discussed in the next section.

Finally, the hierarchical multiple regression analysis in the current study did not control for participants' past exercise experience. Social cognitive theory contends that because exercise

is an ongoing (i.e., repeated) behaviour, past behaviour will inform individuals' social cognitions that play a motivational role in whether participants engage in the behaviour in the future (Bandura, 1986). Weinstein (2007) has argued that when predicting ongoing behaviours, like exercise, researchers should be cautious to control for the relationship between past and current or future behaviour. By not controlling for past behaviour in the current study, it is possible that the social cognitions' predictive utility and effect sizes may have been over-estimated. Thus, future research may benefit from accounting for participants' past exercise experience.

4.7 Future Directions

The current study was among the first to demonstrate that intergoal conflict was a significant, negative predictor of exercise. However, replication of the study findings from similarly designed and experimental research is needed before researchers can confidently claim intergoal conflict is a significant and consistent predictor of exercise in the healthy adult population.

Future investigations to identify a reliable and valid measure of intergoal conflict are needed. Currently, the IRQ subscale is the predominant multi-item intergoal conflict measure being used in the exercise literature (Carraro & Gaudreau, 2015; McKee & Ntoumanis, 2014; Riediger & Freund, 2004), but without consistent predictive utility (Rhodes et al., 2016). Over the longer-term it may be instructive to continue to investigate and make appropriate adaptations to the measure or to consider measurement alternatives. Thus, given the low reliability in the present study, future research may benefit from: (1) further investigation of the reliability of the intergoal conflict subscale of the IRQ; (2) concurrent use of multiple measures of intergoal conflict; or (3) developing a new intergoal conflict measure. One idea for developing a new measure is to first elicit individuals' valued exercise and non-exercise conflicting goals. Then participants could be asked to rate: (1) the extent to which their non-exercise goal(s) conflict with their exercise goal(s); and (2) how often this conflict is actually experienced. Average degree of conflict and frequency scores could then be calculated. This type of measurement approach has been used in the exercise barriers literature where recommendations are for investigators to not provide a one-size-fits-all measure that would not be salient across multiple samples (Brawley, Martin, & Gyurcsik, 1998).

Future research should investigate the relationships between exercise and the predictors investigated in the present study among samples with varying levels of exercise participation. In

contrast to regular exercisers, beginners and irregular exercisers may be more likely to experience more intergoal conflict, lower concurrent self-regulatory efficacy, and report that positive exercise outcome expectations are less likely and/or valued (Bandura, 1986). Value may be of particular importance in motivating individuals to start or re-initiate exercise behaviour and may well predict initial attempts to exercise and adhere. Among experienced exercisers, however, being active is highly valued (i.e., hence the ceiling in participants' reported value perceptions) as reflected by the study data. As a result, the lack of variability in value among study participants would not correlate well with the variability observed in exercise volume. Yet the high value indicates that participants see motivational value in exercise. Thus, value is important as a psychological factor, which helps to encourage adherence but provides no extra predictive advantage in samples of experienced exercisers.

Beginners and those struggling to be regular exercisers may also tend to report negative outcome expectations. Although differences in the cognitive profiles of individuals varying in their exercise have yet to be investigated in the concurrent goals and exercise domain, support exists among an adult sample with arthritis. Findings illustrated inactive participants reported that negative outcomes from exercise were less likely to occur and more distressing than irregular and regular exercisers (Gyurcsik et al., 2015). Relative to intergoal conflict, previous research has shown that less active individuals perceive more intergoal conflict between their goals, and they tend to focus on their non-exercise goals more than their exercise goals (e.g., Jung & Brawley, 2010; Karoly et al., 2005; Presseau et al., 2013). Understanding if beginners, irregular, and regular exercisers differ in their psychological profile may be instructive for future intervention work that would target favourable change in social cognitions in need of improvement in each group (Bandura, 2005).

Given the present research was a proof of principle study and findings were largely supportive of theoretical contentions, future research may benefit by expanding investigation of the current social cognitions and their relationships with exercise in other samples. Notably, the current study examined the prediction of participants' exercise when exercise was measured relative to a total weekly volume of planned moderate-vigorous intensity using a minimum 20-minute bout. Future research may progress to investigating whether similar predictions can be made with different exercise outcome measures. For example, when exercise outcomes are measured specific to: (1) individuals meeting or not meeting the current exercise

recommendation level, which includes a minimum 10-minute bout; (2) individuals who self-identify as being a regular or irregular exerciser, regardless of whether their behaviour meets the public health recommendation; (3) individuals who participate in light intensity exercise; or (4) individuals who vary in their identity as an exerciser (termed exercise identity; Strachan, Brawley, Spink, & Jung, 2009). Understanding if the relationships between the social cognitions and exercise found in the present study remain consistent or not would be instructive to determine future intervention targets that may depend on the exercise context and/or identity of different individuals.

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Appendix A

Survey Measures

Demographics

1) What is the highest level of education that you have completed?

- ☐ No degree, certificate or diploma
- ☐ High school graduation certificate
- ☐ Trades certificate or diploma
- ☐ Community College certificate or diploma
- ☐ University certificate or diploma below bachelor level
- ☐ Bachelor's degree
- ☐ University certificate or diploma above bachelor level
- ☐ Medical degree
- ☐ Master's degree
- ☐ Earned doctorate

2) How tall are you without your shoes?

_____ feet _____ inches OR _____ meters _____ centimeters

3) How much do you weigh without your shoes?

_____ pounds OR _____ kilograms

4) What gender do you identify with?

- ☐ Female
- ☐ Male
- ☐ Other, please specify: _____

5) Regardless of your nationality, which of the following best describes your ancestry (please choose all that apply)?

- ☐ Arab
- ☐ Black
- ☐ Chinese
- ☐ Filipino
- ☐ Latin American
- ☐ North American Indian, Metis, or Inuit
- ☐ Southeast Asian
- ☐ South Asian
- ☐ West Asian
- ☐ White
- ☐ Other

6) What is your marital status?

- ☐Married
- ☐Divorced
- ☐Widowed
- ☐Single
- ☐ Not married, but living with my partner
- ☐ In a relationship, but not married or living with my partner

7) Are you currently (choose all that apply)?

☐Employed full-time ☐Employed part-time ☐A Homemaker
☐A Student ☐Retired ☐ On Disability
☐Self-employed ☐Out of work for > 1 year ☐Out of work for < 1 year

8) What is the approximate range of your household <u>total income</u> from <u>all sources</u>?

☐$0-9,999 ☐$10,000-19,999 ☐$20,000-29,999 ☐$30,000-39,999
☐$40,000-49,999 ☐$50,000-59,999 ☐$60,000-69,999 ☐$70,000-79,999
☐$80,000 or more ☐Do not wish to say

9) What medical conditions do you have (choose all that apply)?

☐Lung/Cardiopulmonary Disease
☐High blood pressure
☐Heart/Cardiovascular disease
☐Arthritis
☐Diabetes
☐Thyroid disease
☐Cancer
☐Other, please specify:_____
☐None

10) How much <u>free time</u> do you have on a typical weekday (Monday to Friday)?

Free time means <u>waking hours that you spend outside of being required to be at your job or at school for classes</u>. For some people, this free time may include doing work or school work at home, care giving (i.e., watching kids/helping parents), hobbies, etc.

_____ 0 hours each day
_____ 1 hour each day
_____ 2 hours each day
_____ 3 hours each day
_____ 4 hours each day
_____ 5 hours each day
_____ 6 hours each day
_____ 7 hours each day
_____ 8 hours each day
_____ 9 hours each day
_____ 10 or more hours each day

10) How much <u>free time</u> do you have on a typical weekend (Saturday or Sunday)?

Free time means <u>waking hours that you spend outside of being required to be at your job or at school for classes</u>. For some people, this free time may include doing work or school work at home, care giving (i.e., watching kids/helping parents), hobbies, etc.

_____ 0 hours each day
_____ 1 hour each day
_____ 2 hours each day
_____ 3 hours each day

_____ 4 hours each day
_____ 5 hours each day
_____ 6 hours each day
_____ 7 hours each day
_____ 8 hours each day
_____ 9 hours each day
_____ 10 or more hours each day

Definition of Goals

We are interested in the activities that you have goals to pursue during your free time.

The next section of the survey asks you about the goal-directed activities that you wish to pursue.

What is a goal? A goal is defined here as an objective/outcome that we try to achieve by doing a behaviour.

Many of us have several goals. We understand you may have goals while at work or while attending your scheduled school classes.

However, we would like you to focus on ONLY identifying the goals you make plans to achieve in advance during your free time. These could be activities like doing a hobby, socializing with friends, learning a new skill, care giving, or exercising.

Exercise Goal Elicitation

First, we would like you to think about any exercise goal(s) that you wish to achieve during your free time in the next month (4 weeks).

We know it is possible to have many different exercise goals. However, when answering the following 5 questions, we would like you to tell us about ONLY your **most important** exercise goal. This would be a goal that you **most highly value.**

1) **Think about a typical week in the next month (4 weeks).** Please tell us what your **most important** exercise goal is that you wish to achieve in your **free time**:

2) How much **value** do you place on **achieving this exercise goal during a typical week in the next month (4 weeks)**:

1	2	3	4	5	6	7	8	9
I do not value this goal at all								I value this goal very much

(must answer with a rating of 6 or higher to be included)

3) How many hours **in a typical week** do you plan to spend pursuing this exercise goal in the next month (4 weeks)?

_____ hours in a week

Conflicting Non-Exercise Goal Elicitation

We are also interested in the other **leisure activities**, besides exercise, that you wish to do.

Leisure activities are things you **choose and plan to do during your free time. These are ANY activities you do during waking hours when you are not at work or school.** For example, leisure activities may include things like spending time doing hobbies, socializing, doing work or school work at home, or care giving for parents/children.

Please think about other leisure activity goal(s), besides exercise, that you wish to achieve during your free time in the next month (4 weeks).

Have you set a **non-exercise goal** that you wish to achieve during your **free time** in the **NEXT month** (4 weeks), for **at least 20 minutes at one time**?

Yes_____ No_____

(must answer "yes" to participate; "no" branches to demographics and exited from the survey)

We know that people may engage in many non-exercise goal activities. Please remember it is **important** for you to focus on reporting ONLY the goals you make **plans to achieve in advance during your free time.**

When answering the following question, please tell us about **your most important – meaning most highly valued –** non-exercise goal that you wish to achieve during a typical week in the next month (4 weeks).

1) In the space provided, please list **your most important**, **non-exercise** goal that you wish to achieve in your **free time** during the **next month (4 weeks)**:

a.

Please note that the leisure activity goal that you just listed will be referred to as your **"IMPORTANT NON-EXERCISE GOAL" in the remainder of the survey.**

Please only think about this particular goal when answering the rest of the survey questions.

2) How much **value** do you place on **achieving your <u>important non-exercise</u> goal during a typical week in the next month (4 weeks)**:

1	2	3	4	5	6	7	8	9
I do not value this goal at all								I value this goal very much

(must answer with a rating of 6 or higher to be included)

3) How many hours **in a typical week** do you plan to spend pursuing your **<u>important non-exercise goal</u>** in the **next month (4 weeks)**?

_____ hours in a week

This next section of the survey will ask you questions about how your most **important non-exercise goal is related to your exercise goal.**

Sometimes people's goals conflict with or facilitate one another.

Conflict means that your important non-exercise goal may <u>prevent</u> you from achieving your exercise goal. This is because the other goal may take place at the same time as your planned exercise. Or maybe you only have a certain amount of free time in your day and you have to pick what to do.

For example, you may make plans to go to the gym at 3 pm one day, but your close friend wants to meet for coffee at that time too. Or you may have an hour after work that you could use to go to the gym or to spend time with your family. In either situation, you must choose what to do.

Facilitate means that your most important non-exercise goal <u>helps</u> you achieve your exercise goal. This is because you can pursue the non-exercise goal at the same time as your exercise goal.

For example, you may plan to walk for an hour in the afternoon and you want to spend time with your family. However, you choose to do both at the same time by going for a walk with your family.

1) Overall, would you say that your **important non-exercise goal will <u>conflict</u> with or <u>facilitate</u> your exercise goal during a typical week in the next month?**

☐Conflicts with (hinders my progress towards) my exercise goal
☐Facilitates (helps my progress towards) my exercise goal
☐Neither conflicts nor facilitates my exercise goal

(must indicate "conflicts" to participate)

Intergoal Conflict Subscale of the Intergoal Relations Questionnaire (IRQ)

The following 4 questions will ask you about different types of challenges you may experience to managing both your **important non-exercise goal** at the **same time** as your **important exercise goal**.

Please indicate how often you may experience the following **in a typical week over the next month (4 weeks):**

1) How often in a typical week can it happen that, **because of pursuit of your important non-exercise goal, you do not invest as much time into your exercise goal** as you would like to**?**

1	2	3	4	5
Very rarely/ Never	Rarely	Sometimes	Often	Very Often/ Always

2) How often in a typical week can it happen that, **because of pursuit of your important non-exercise goal, you do not invest as much energy into your exercise goal** as you would like to?

1	2	3	4	5
Very rarely/ Never	Rarely	Sometimes	Often	Very Often/ Always

3) How often in a typical week can it happen that, **because of pursuit of your important non-exercise goal, you do not invest as much money into your exercise goal** as you would like to?

1	2	3	4	5
Very rarely/ Never	Rarely	Sometimes	Often	Very Often/ Always

4) How often in a typical week can it happen that, **you do something in pursuit of your important non-exercise goal that does not help you to achieve your exercise goal?**

1	2	3	4	5
Very rarely/ Never	Rarely	Sometimes	Often	Very Often/ Always

Positive Exercise Outcome Expectancies

We may expect positive or negative outcomes to happen as a result of exercising. We would like you to **only** focus on the **positive** outcomes that you think may happen.

In the spaces below, please list the things **you expect** to happen as a result of **exercising** in the **next month (4 weeks).**

1) Moderate-vigorous exercise in the next month (4 weeks) will …

For each of the outcomes you listed, please tell us how **likely** it is that each outcome will happen in the next month **as a result of doing exercise** AND how much **value** you place on whether each of the outcomes happens.

1) Outcome 1

a. How likely is it that this outcome will occur in the next month?

1	2	3	4	5	6	7	8	9
Very unlikely		Somewhat unlikely		Neither likely nor unlikely		Somewhat likely		Very likely

b. How much do you value this outcome?

1	2	3	4	5	6	7	8	9
Not valuable at all to me				Somewhat valuable to me				Very valuable to me

2) Outcome 2

a. How likely is it that this outcome will occur in the next month?

1	2	3	4	5	6	7	8	9
Very unlikely		Somewhat unlikely		Neither likely nor unlikely		Somewhat likely		Very likely

b. How much do you value this outcome?

1	2	3	4	5	6	7	8	9
Not valuable at all to me				Somewhat valuable to me				Very valuable to me

3) Outcome 3

a. How likely is it that this outcome will occur in the next month?

1	2	3	4	5	6	7	8	9
Very unlikely		Somewhat unlikely		Neither likely nor unlikely		Somewhat likely		Very likely

b. How much do you value this outcome?

1	2	3	4	5	6	7	8	9
Not valuable at all to me				Somewhat valuable to me				Very valuable to me

4) Outcome 4

a. How likely is it that this outcome will occur in the next month?

1	2	3	4	5	6	7	8	9
Very unlikely		Somewhat unlikely		Neither likely nor unlikely		Somewhat likely		Very likely

b. How much do you value this outcome?

1	2	3	4	5	6	7	8	9
Not valuable at all to me				Somewhat valuable to me				Very valuable to me

5) Outcome 5

a. How likely is it that this outcome will occur in the next month?

1	2	3	4	5	6	7	8	9
Very unlikely		Somewhat unlikely		Neither likely nor unlikely		Somewhat likely		Very likely

b. How much do you value this outcome?

1	2	3	4	5	6	7	8	9
Not valuable at all to me				Somewhat valuable to me				Very valuable to me

Concurrent Self-Regulatory Efficacy

For the following questions, please think about managing your most important (valued) exercise and non-exercise goals **concurrently** (at the same time) over the next month (4 weeks).

Please rate your **confidence** in your ability to manage **both** goals during **a typical week in the next month (4 weeks).**

1) How **confident** are you in your ability to **manage both your exercise and important non-exercise goal at the same time** during a typical week?

0	1	2	3	4	5	6	7	8	9	10
Not at all confident										Extremely confident

2) How **confident** are you in your ability to **manage both your exercise and important non-exercise goal so that your time is used effectively** during a typical week?

0	1	2	3	4	5	6	7	8	9	10
Not at all confident										Extremely confident

3) How **confident** are you in your ability to **make up for any missed sessions for both your exercise and important non-exercise goal** during a typical week?

0	1	2	3	4	5	6	7	8	9	10
Not at all confident										Extremely confident

4) How **confident** are you in your ability to **manage the goal-setting for both your exercise and important non-exercise activities so that your goals for a typical week will be accomplished?**

0	1	2	3	4	5	6	7	8	9	10
Not at all confident										Extremely confident

5) How **confident** are you in your ability to **accurately monitor your time so that you are able to make progress towards both your exercise and important non-exercise goal** during a typical week?

0	1	2	3	4	5	6	7	8	9	10
Not at all confident										Extremely confident

Time 2 Survey Reminder of Participant Rights

Thank you for filling out our second survey. You will need to do this second survey at one time/sitting since your answers **CANNOT be saved** for a later time.

This survey will take about 5-10 minutes.

Please read each question carefully and complete it to the best of your ability. There are no right or wrong answers. Please give your immediate response.

We would like to remind you that **participation is voluntary.** You can decide not to participate at any time by closing your browser, or choose not to answer any questions you don't feel comfortable with.

The questions are numbered. Please don't be concerned if the numbers do not go in order. After you are done answering one page, please click "Next" to continue. If you need to go back in the survey, use the "Back" button at the bottom of the page.

You will have to hit the "Submit" button at the end of the survey to submit the survey.

Once you submit your survey, your data cannot be removed from the study because we will have no way to match your responses to your name.

Thank you very much for participating!

Time 2 Exercise

We would like you to think about your exercise history. Getting an accurate report of your exercise is one key to our research, so please carefully read the following:

ONLY think about exercise that you planned to do in your free time. This means that you scheduled/planned it and set time aside in your day to exercise.

We also want you to think about your planned exercise that you did for **20 minutes or more at one time.**

Some examples of exercise: You may be registered for a swim or fitness class at your local gym – this means that you have plans to exercise on each day that your class takes place in a week.

Exercise may also be planned when you get home from work or school. Perhaps you notice it is nice outside and you plan to go for a walk. **It is important that you made plans to exercise in advance and set time aside during your free time to exercise for 20 minutes or more.**

We understand that you may do other types of exercise. For example, you may walk while doing groceries, have a physically demanding job, or do planned exercise for less than 20 minutes at one time. While these types of exercise are important, they ***are not*** the focus of our research.

With this in mind, please think about 2 types of planned exercise: **(1) Moderate** and **(2) Vigorous**.

Moderate exercise makes your heart beat faster and makes you breathe a little harder. You can *easily talk* while doing moderate exercise, but you may not be able to sing comfortably.

Vigorous exercise makes your heart beat much faster. You *may not be able to talk comfortably* without stopping to catch your breath.

Intensity can be estimated using a scale of 0 to 10, where sitting is 0 and 10 is the highest level of effort possible. **Moderate intensity exercise is a 5 or 6. Vigorous intensity exercise is a 7 or 8.**

Think about the last month (4 weeks). Did you do any planned moderate or vigorous exercise for at least 20 minutes at one time during your free time?

Yes_____ No_____
(must answer "yes" to continue to the next questions; “no” skips to the end of the survey)

A) Please think about a typical week (i.e., Monday-Sunday) **during the last month (4 weeks).** On average, how many **days in each 7-day period** (1 week) did you **actually do MODERATE exercise for at least 20 continuous minutes during your free time**?

_____ 0 days in a week (skip to vigorous questions)
_____ 1 day in a week
_____ 2 days in a week
_____ 3 days in a week
_____ 4 days in a week
_____ 5 days in a week
_____ 6 days in a week
_____ 7 days in a week

How many TOTAL MINUTES were you doing planned moderate exercise **in a typical day**?

> We would like you to give us your best estimate of the average amount of time you exercised. For example, if you did a total of 40 minutes on one day and 30 minutes on another day, your average would be 35 minutes.
>
> Please remember to only think about those times when you did 20 minutes or more.

_____ Total minutes in a typical day

What kinds of moderate exercise did you do (check all that apply)?
_____ Walking
_____ Swimming class
_____ Swimming laps
_____ Land-based exercise class
_____ Bike
_____ Weight training
_____ Jogging
_____ Sports: _____
_____ Other: _____

B) Please think about a typical week (i.e., Monday-Sunday) **during the last month (4 weeks)**. On average, how many **days in each 7-day period** (1 week) did you **actually do VIGOROUS exercise for at least 20 continuous minutes during your free time**?

_____ 0 days in a week (skip to end of the survey)
_____ 1 day in a week
_____ 2 days in a week
_____ 3 days in a week
_____ 4 days in a week
_____ 5 days in a week
_____ 6 days in a week
_____ 7 days in a week

How many TOTAL MINUTES were you doing your planned vigorous exercise **in a typical day**?

We would like you to give us your best estimate of the average amount of time you exercised. For example, if you did a total of 40 minutes on one day and 30 minutes on another day, your average would be 35 minutes.

Please remember to only think about those times when you did 20 minutes or more.

_____ Total minutes in a typical day

What kinds of vigorous exercise did you do (check all that apply)?

_____ Walking
_____ Swimming class
_____ Swimming laps
_____ Land-based exercise class
_____ Bike
_____ Weight training
_____ Running
_____ Sports: _____
_____ Other: _____

Appendix B

Recruitment Materials

UNIVERSITY OF SASKATCHEWAN
College of Kinesiology
KINESIOLOGY.USASK.CA

TRYING TO MANAGE MULTIPLE GOALS AT ONCE?
IS ONE YOU YOUR GOALS ABOUT EXERCISE?

IF YES, then, we need your help for a research study!

The study purpose is to identify and better understand the challenges people face when they try to pursue many different goals in their free time, including exercise.

We welcome you to participate if you:

- ✓ Have exercised in the past month and have plans to exercise in the near future
- ✓ Have a goal to do other activities, in addition to exercise, during your free time
- ✓ Are 18 years of age or older
- ✓ Do not currently have any health issues or injuries that completely limit your activities

Want to volunteer? It's easy: You will be invited to do two online surveys about your exercise and non-exercise goals you wish to pursue during your free time. You will be asked about your thoughts towards managing these goals at the same time. You will also be asked to report information about yourself, such as your age.

The first survey will take approximately 25-30 minutes to complete. Then, one month later, you will be invited to complete a second online survey. This survey will ask you about the activities that you actually did during your free time. The second survey will take 5-10 minutes to do.

Your involvement would be of great help to us!

Are there any risks to you? There are ***no risks to doing our study***. You simply share your thoughts about things you do during your free time. It's that simple!

Are your survey answers confidential? Absolutely!
You will be asked for your email address so that we can send you the second survey. However, we have procedures in place to ensure your email is not associated with your survey responses. Only the researchers will see your answers. Plus, we will present study findings in group form only. We have procedures in place to make sure that your answers are protected.

This study is being conducted as part of a Master's student's thesis. Our study is approved by the University of Saskatchewan Behavioural Research Ethics Board (BEH 16-165) on May 13th 2016.

If you are interested in volunteering for this study, please contact us!
(306) 966-8659 or goals.study@usask.ca

Or you can access the survey here: https://fluidsurveys.usask.ca/s/goal-study/

UNIVERSITY OF SASKATCHEWAN
College of Kinesiology
KINESIOLOGY.USASK.CA

Are you an exerciser who is 18 years of age or older?

Researchers at the University of Saskatchewan are currently seeking volunteers for an online research study to identify and better understand the challenges people face in whether they choose to do exercise or other activities during their free time.

We welcome you to participate if:

- ✓ **You exercised in the past month and have plans to exercise in the near future**
- ✓ **You have goals to do other activities, in addition to exercise, during your free time**
- ✓ **You are 18 years of age or older**
- ✓ **You do not currently have any health issues or injuries**

If you decide to participate, you will be asked to complete **2 online surveys.** The first survey will take approximately **25-30 minutes** to complete. One month later, you will be invited to complete the second survey, which will take 5-10 minutes.

Your participation would be a great help to us!

If you are interested in volunteering, and we described you above, please follow this link: https://fluidsurveys.usask.ca/s/goal-study/

This study is being conducted as part of a Master's student's thesis. This study has been reviewed by and received approval from the University of Saskatchewan's Research Ethics Board (BEH 16-165) on May 13th 2016.

For more information, contact:
Jocelyn Blouin, MSc Candidate & Nancy Gyurcsik, PhD
College of Kinesiology
University of Saskatchewan
Email: goals.study@usask.ca
Telephone: 306-966-8659

https://fluidsurveys.usask.ca/s/goal-study/	https://fluidsurveys.usask.ca/s/goal-study/	https://fluidsurveys.usask.ca/s/goal-study/	https://fluidsurveys.usask.ca/s/goal-study/	https://fluidsurveys.usask.ca/s/goal-study/	https://fluidsurveys.usask.ca/s/goal-study/	https://fluidsurveys.usask.ca/s/goal-study/	https://fluidsurveys.usask.ca/s/goal-study/	https://fluidsurveys.usask.ca/s/goal-study/

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ARE YOU AN EXERCISER?

DO YOU DO OTHER ACTIVITIES DURING YOUR FREE TIME?

IF YES, then, we need your help for a research study!

The study purpose is to identify and better understand the challenges people face when they try to pursue many different goals in their free time, including exercise.

We welcome you to participate if you:

- ✓ Have exercised in the past month and have plans to exercise in the near future
- ✓ Have a goal to do other activities, in addition to exercise, during your free time
- ✓ Are 18 years of age or older
- ✓ Do not currently have any health issues or injuries that completely limit your activities

Want to volunteer? It's easy: You will be invited to do two online surveys about your exercise and non-exercise goals you wish to pursue during your free time. You will be asked about your thoughts towards managing these goals at the same time and to report information about yourself.

The first survey will take approximately 15-25 minutes to complete. Then, one month later, you will be invited to complete a second online survey. This survey will ask you about the activities that you actually did during your free time. The second survey will take 5-10 minutes to do.

Your involvement would be of great help to us!

Are there any risks to you? There are ***no risks to doing our study***. You simply share your thoughts about things you do during your free time. It's that simple!

Are your survey answers confidential? Absolutely!
You will be asked for your email address so that we can send you the second survey. However, we have procedures in place to ensure your email is not associated with your survey responses. Plus, we will present study findings in group form only.

This study is being conducted as part of a student's thesis. Our study is approved by the University of Saskatchewan Behavioural Research Ethics Board (BEH 16-165) on May 13th 2016.

If you are interested in volunteering, please contact us at 306-966-8659 / goals.study@usask.ca

Or you can access the survey here: https://fluidsurveys.usask.ca/s/goal-study/

https://fluidsurveys.usask.ca/s/goal-study/	**https://fluidsurveys.usask.ca/s/goal-study/**	**https://fluidsurveys.usask.ca/s/goal-study/**	**https://fluidsurveys.usask.ca/s/goal-study/**	**https://fluidsurveys.usask.ca/s/goal-study/**	**https://fluidsurveys.usask.ca/s/goal-study/**	**https://fluidsurveys.usask.ca/s/goal-study/**	**https://fluidsurveys.usask.ca/s/goal-study/**	**https://fluidsurveys.usask.ca/s/goal-study/**

Social Media Announcement Examples

Facebook:
Do you do exercise and other leisure activities during your free time? Are you over the age of 18 years? A Master's student from the University of Saskatchewan is conducting new research on challenges during leisure and needs your help. For more information: https://fluidsurveys.usask.ca/s/goal-study/

Twitter:
A Masters student at @usask needs your help! Take her survey to support new research on challenges during leisure: fluidsurveys.usask.ca/s/goal-study/

Online Bulletin Example

Are you an exerciser who is 18 years of age or older?

Researchers at the University of Saskatchewan are currently seeking volunteers for an online research study to identify and better understand the challenges people face in whether they choose to do exercise among their other planned activities.

We welcome you to participate if:

- ✓ **You exercised in the past month and have plans to exercise in the near future**
- ✓ **You have goals to do other activities, in addition to exercise, during your free time**
- ✓ **You are 18 years of age or older**
- ✓ **You do not currently have any health issues or injuries**

If you decide to participate, you will be asked to complete **2 online surveys.** The first survey will take approximately **25-30 minutes** to complete. One month later, you will be invited to complete the second survey, which will take 5-10 minutes.

Your participation would be a great help to us!

If you are interested in volunteering, and we described you above, please follow this link: [https://fluidsurveys.usask.ca/s/goal-study/]

This study is being conducted as part of a Master's student's thesis. This study has been reviewed by and received approval from the University of Saskatchewan's Research Ethics Board (BEH 16-165) on May 13th 2016.

For more information, contact:
Jocelyn Blouin, MSc Candidate & Nancy Gyurcsik, PhD
College of Kinesiology
University of Saskatchewan
goals.study@usask.ca

Appendix C

Online Consent Form

UNIVERSITY OF SASKATCHEWAN

Project Title: Concurrent management of personally valued and conflicting leisure time goals: Identifying social cognitions that predict exercise.

Researcher(s): Jocelyn Blouin, BSc (Hon.), MSc Student, College of Kinesiology, University of Saskatchewan. Phone: 306-966-8659. Email: jocelyn.blouin@usask.ca

Supervisor: Nancy Gyurcsik, PhD, Professor, College of Kinesiology, University of Saskatchewan. Phone: 306-966-1075. Email: nancy.gyurcsik@usask.ca

This survey is designed to understand individuals' thoughts about managing multiple leisure time goals at the same time. Leisure time goals are things you plan to do in your free time that you highly value doing. Information from this study will help us to better understand the challenges people face in whether they choose to do exercise among other planned activities.

Participation in this study is voluntary. You can decide not to participate at any time by closing your browser. You can also choose to not answer any questions that you don't feel comfortable with.

Procedures: To participate you will be asked to fill out 2 surveys on the Internet. The first survey will take you about 25-30 minutes. You will be asked to fill out the second survey 4 weeks later. The second survey will take 5-10 minutes. Total participation time will be approximately 50 minutes, if you do both surveys. You can do the surveys on any computer at any location of your choosing.

You will be asked to give us your email address at the end of the first survey. This will allow us to email you the link to the second survey, 4 weeks later. It will also allow us to send you up to 3 reminder emails to complete the second survey, if needed.

At the end of the second survey, you will be asked if you want to receive a copy of the study results by the end of December 2016. If so, you will be asked to provide an email address again.

If your email address has your name in it, you may be identified to the researchers. However, they will never identify you as a study participant. Your email address will be stored separate from your survey responses and will be destroyed from our records once our research is done.

Please contact one of the researchers using the information at the top of this page if you have any questions about the procedures, goals of the study, or your potential role in it.

There are no known risks to participating in this survey; however, as with any online related activity the risk of breach of confidentiality is possible.

This survey is hosted by Fluid Surveys, a USA owned company. Please see the following for more information on Fluid Surveys Data Privacy in Canada.

This research project has been approved on ethical grounds by the University of Saskatchewan Research Ethics Board on May 13th, 2016. Any questions regarding your rights as a participant may be addressed to that committee through the Research Ethics Office, email: ethics.office@usask.ca; or call 306-966-2975. Out of town participants may call toll free 1-888-966-2975.

The data collected will be used in a Master's student's thesis research project in the College of Kinesiology, University of Saskatchewan.

The survey will ask you questions about your exercise and other activities you do in your free time. You will also be asked to report your thoughts about doing your exercise and other activities. You will be asked information about yourself, such as your age and gender. This information will be used to describe the people who are eligible to do the survey.

By completing and submitting this survey, **your free and informed consent is implied and indicates that you understand the above conditions of participation in this study.**

Please print a copy of this form if you wish to keep it.

Informed consent:

☐ No - I do not want to participate in the study.

☐ Yes - I want to do the survey.

Appendix D

Inclusion Criteria

1) What is your age in years: _____ (must indicate 18+ years to participate)

2) Where do you currently live?

☐ Canada
☐ Other country: _____ (must indicate Canada or the USA to participate)

3) Do you currently have any health issues or injuries that would completely prevent you from participating in activities during your free time over the next month (4 weeks)?

Yes_____ No_____ (must answer "no" to participate)

4) Please provide an email address so that the researchers may send you a link via email to the Time 2 survey in 4 weeks:

NOTE: The researchers may send you up to 3 reminder emails for you to complete the Time 2 survey. **Please ensure the email you provide is valid and accurately entered.**

5) Past Exercise

We would like you to think about your exercise history. Getting an accurate report of your exercise is one key to our research, so please carefully read the following:

ONLY think about exercise that you planned to do in your free time. This means that you scheduled/planned it and set time aside in your day to exercise.

We also want you to think about your planned exercise that you did for **20 minutes or more at one time.**

Some examples of exercise: You may be registered for a swim or fitness class at your local gym – this means that you have plans to exercise on each day that your class takes place in a week.

Exercise may also be planned when you get home from work or school. Perhaps you notice it is nice outside and you plan to go for a walk. **It is important that you made plans to exercise in advance and set time aside during your free time to exercise for 20 minutes or more.**

We understand that you may do other types of exercise. For example, you may walk while doing groceries, have a physically demanding job, or do planned exercise for less than 20 minutes at one time. While these types of exercise are important, they ***are not*** the focus of our research.

With this in mind, please think about 2 types of planned exercise: **(1) Moderate** and **(2) Vigorous**.

Moderate exercise makes your heart beat faster and makes you breathe a little harder. You can *easily talk* while doing moderate exercise, but you may not be able to sing comfortably.

Vigorous exercise makes your heart beat much faster. You *may not be able to talk comfortably* without stopping to catch your breath.

Intensity can be estimated using a scale of 0 to 10, where sitting is 0 and 10 is the highest level of effort possible. **Moderate intensity exercise is a 5 or 6. Vigorous intensity exercise is a 7 or 8.**

Think about the last month (4 weeks). Did you do any planned moderate or vigorous exercise for at least 20 minutes at one time during your free time?

Yes_____ No_____ (must answer "yes" to participate; "no" branches to the demographics)

A) Please think about a typical week (i.e., Monday-Sunday) during the last month. On average, how many **days in each 7-day period** (1 week) did you **actually do MODERATE exercise for at least 20 continuous minutes during your free time**?

_____ 0 days in a week (skip to vigorous questions)
_____ 1 day in a week
_____ 2 days in a week
_____ 3 days in a week
_____ 4 days in a week
_____ 5 days in a week
_____ 6 days in a week
_____ 7 days in a week

How many TOTAL MINUTES were you doing planned moderate exercise **in a typical day**?

We would like you to give us your best estimate of the average amount of time you exercised. For example, if you did a total of 40 minutes on one day and 30 minutes on another day, your average would be 35 minutes.

Please remember to ONLY think about those times when you did 20 minutes or more.

What kinds of moderate exercise did you do (check all that apply)?

_____ Walking
_____ Swimming class
_____ Swimming laps
_____ Land-based exercise class
_____ Bike
_____ Weight training
_____ Jogging
_____ Sports: _____
_____ Other (please specify):_____

B) Please think about a typical week (i.e., Monday-Sunday) during the last month. On average, how many **days in each 7-day period** (1 week) did you **actually do VIGOROUS exercise for at least 20 continuous minutes during your free time**?

_____ 0 days in a week (skip to next section of the survey)
_____ 1 day in a week
_____ 2 days in a week
_____ 3 days in a week
_____ 4 days in a week
_____ 5 days in a week
_____ 6 days in a week
_____ 7 days in a week

How many TOTAL MINUTES were you doing your planned vigorous exercise **in a typical day**?

We would like you to give us your best estimate of the average amount of time you exercised. For example, if you did a total of 40 minutes on one day and 30 minutes on another day, your average would be 35 minutes.

Please remember to ONLY think about those times when you did 20 minutes or more.

What kinds of vigorous exercise did you do (check all that apply)?
_____ Walking
_____ Swimming class
_____ Swimming laps
_____ Land-based exercise class
_____ Bike
_____ Weight training
_____ Running
_____ Sports: _____
_____ Other (please specify):_____

6) Future Exercise

We are also interested in whether you have plans to do moderate or vigorous exercise in the next month.

C) Have you set a goal to do **moderate to vigorous exercise** in your **free time** during the **NEXT month** (4 weeks), for **at least 20 minutes at one time**?

Yes_____ No_____ (must answer yes to participate; no branches to demographics)

Appendix E

Study Adherers and Dropouts

Study adherers (n = 87) and dropouts (n = 21) were compared on all demographics and primary study variables measured at Time 1. Categorical demographics (i.e., gender, race, education, total annual household income, marital and employment statuses; see Table F.1) were compared using chi-square tests. Results indicated significant frequency differences in the races of adherers and dropouts; $\chi^2 = 7.43$, $p = .02$. Minority races tended to dropout from the study. All other chi-square tests were non-significant (p's > .05).

Differences between continuous demographics (i.e., age and BMI; see Table F.2) were examined using a multivariate analysis of variance (MANOVA). The overall model was not significant indicating study adherers and dropouts did not differ in age or BMI; F (2, 102) = 1.00, Pillai's Trace = .02, p = .37.

MANOVA was also used to compare study adherers and dropouts in their Time 1 primary study variables (i.e., exercise and non-exercise goal value; intergoal conflict; positive exercise outcome expectation likelihood and value; and concurrent self-regulatory efficacy). The overall model was not significant, F (6, 101) = 1.54, Pillai's Trace = .08, p = .17. Means and standard deviations of primary study variables for each group are presented in Table F.3.

In summary, study adherers and dropouts did not differ significantly in their continuous demographics and primary study variables. In addition, the two groups did not significantly differ on the majority of the categorical demographics, with the exception of race.

Table F.1
Categorical Demographics of Study Adherers and Dropouts (N = 108)

Demographic	Category	*Adherers* *n* (%)	*Dropouts* *n* (%)
Residency	Canada	84 (96.55)	20 (95.24)
	United States of America	3 (3.45)	1 (4.76)
Gender	Female	73 (83.91)	15 (71.42)
	Male	14 (16.09)	5 (23.81)
Race	White	73 (83.91)	13 (61.90)
	Chinese	1 (1.15)	1 (4.76)
	Black	0 (0.00)	1 (4.76)
	Filipino	0 (0.00)	1 (4.76)
	South East Asian	2 (2.30)	0 (0.00)
	South Asian	1 (1.15)	0 (0.00)
	West Asian	0 (0.00)	1 (4.76)
	North American Aboriginal	0 (0.00)	1 (4.76)
	Arab	1 (1.15)	0 (0.00)
	Other	2 (2.30)	1 (4.76)
	Multiple	7 (8.05)	1 (4.76)
Total Annual Household Income	$0 – 9,999	1 (1.15)	2 (9.52)
	$10,000 – 19,999	8 (9.20)	0 (0.00)
	$20,000 – 29,999	1 (1.15)	3 (14.29)
	$30,000 – 39,999	5 (5.75)	2 (9.52)
	$40,000 – 49,999	4 (4.60)	0 (0.00)
	$50,000 – 59,999	9 (10.34)	1 (4.76)
	$60,000 – 69,999	4 (4.60)	2 (9.52)
	$70,000 – 79,999	6 (6.90)	1 (4.76)
	$80,000 or more	38 (43.68)	7 (33.33)
	Prefer to not say	11 (12.64)	2 (9.52)
Education	None	1 (1.15)	1 (4.76)
	High school graduate	20 (22.99)	3 (14.29)
	Trades cert./dip.	2 (2.30)	0 (0.00)
	Community college cert./dip.	3 (3.45)	2 (9.52)
	University < bachelors	4 (4.60)	4 (19.05)
	Bachelors degree	33 (37.93)	6 (28.57)
	University > bachelors	3 (3.45)	1 (4.76)
	Medical degree	2 (2.30)	1 (4.76)
	Masters degree	15 (17.24)	1 (4.76)
	Earned doctorate	3 (3.45)	1 (4.76)
Marital Status	Married	36 (41.38)	4 (19.05)
	Single	19 (21.84)	6 (28.57)
	Not married, living with partner	19 (21.84)	4 (19.05)
	Divorced	2 (2.30)	2 (9.52)
	In relationship, not married/ living with partner	9 (10.34)	4 (19.05)

Table F.1

Categorical Demographics of Study Adherers and Dropouts (N = 108) (continued)

Demographic	Category	*Adherers* *n* (%)	*Dropouts* *n* (%)
Employment Status	Employed full-time	34 (39.08)	9 (42.86)
	Employed part-time	8 (9.20)	1 (4.76)
	Homemaker	1 (1.15)	1 (4.76)
	Student	9 (10.34)	2 (9.52)
	Self-employed	3 (3.45)	0 (0.00)
	Unemployed <1 year	1 (1.15)	0 (0.00)
	Unemployed >1 year	1 (1.15)	0 (0.00)
	Multiple responses	28 (32.18)	7 (33.33)

Note. $n = 87$ for study adherers who formed the study sample; $n = 21$ for study dropouts; Complete data for the 108 participants are not reported due to missing values for gender ($n = 1$), race ($n = 1$), income ($n = 1$), education ($n = 2$), marital status ($n = 3$), and employment status ($n = 3$).

Table F.2

Continuous Demographics of Study Adherers and Dropouts (N = 108)

Variable	Unit	*Adherers* *M* (*SD*)	*Dropouts* *M* (*SD*)
Age	Years	31.67 (10.90)	29.00 (8.72)
BMI	Kg/m^2	24.04 (4.83)	25.03 (4.94)

Note. $n = 87$ for adherers; $n = 21$ for dropouts.

Table F.3

Descriptive Statistics of Primary Study Variables for Study Adherers and Dropouts

Variable	*Adherers* *M* (*SD*)	*Dropouts* *M* (*SD*)
Non-exercise goal value	8.39 (0.91)	8.62 (0.74)
Exercise goal value	7.64 (1.02)	7.48 (1.20)
Intergoal conflict	3.08 (0.96)	3.33 (1.06)
Concurrent self-regulatory efficacy	6.26 (1.59)	6.38 (1.43)
Positive outcome expectancy likelihood	7.70 (0.90)	7.26 (0.99)
Positive outcome expectancy value	8.00 (0.82)	7.55 (0.99)
Time 2 exercise	228.63 (166.58)	–

Note. $n = 87$ for adherers; $n = 21$ for dropouts; Measures had the following response ranges: (1) non-exercise and exercise goal value were 1 (*I do not value this goal at all*) to 9 (*I value this goal very much*); (2) intergoal conflict was 1 (*very rarely/never*) to 5 (*very often/always*); (3) concurrent self-regulatory efficacy was 0 (*not at all confident*) to 10 (*extremely confident*); (4) positive outcome expectancy likelihood was 1 (*very unlikely*) to 9 (*very likely*); (5) positive outcome expectancy value was 1 (*not valuable at all to me*) to 9 (*very valuable to me*); and (6) Time 2 exercise was a total volume calculated by summing the frequency and duration of moderate and vigorous exercise bouts.

Appendix F

Summary of Participants' Goals

Table G.1
Elicited exercise and non-exercise leisure time goals (N = 87)

Exercise Goals (*n*)
Frequency Related (29) e.g., exercise 5 times per week
Performance Related (19) e.g., improve time, sets, repetitions, or specific skills of an exercise
Scheduling Related (12) e.g., attend regularly/consistently, adhere to a training plan, plan daily active transport
General Health (10) e.g., to be/stay healthy, to be fit/in better shape
Appearance Related (9) e.g., to tone up, to look better
Fitness Related (7) e.g., improve endurance, strength, flexibility
Psychological Well-Being Related (1) e.g., to relax, decrease anxiety levels, feel good
Non-Exercise Goals (*n*)
Interpersonal (25) e.g., visiting family, meeting with friends, maintaining social relationships
Work/School (21) e.g., finishing any work or school-related tasks at home during free time
Hobby (15) e.g., doing activities for pleasure, such as gardening, knitting, painting
Care Giving (12) e.g., caring for/looking after one's children, parents, or other dependents
Personal Growth (6) e.g., practicing a religion or skill for personal development reasons
Daily Life (4) e.g., shopping, housework
Volunteering (3) e.g., spending time engaged in volunteer work
General Health (1) e.g., eating healthily, finding time to relieve stress

Appendix G

Summary of Positive Exercise Outcome Expectations

Table H.1
Elicited positive exercise outcome expectations (N = 87)

Physical outcome expectations (*n*)
Exercise will …
1. Help control my weight (32)
2. Help me increase strength (27)
3. Improve my ability to perform a specific skill (e.g., exercise or sport-related) (18)
4. Help me build/maintain endurance (12)
5. Increase muscle tone/definition (9)
6. Help me build/maintain cardiovascular fitness (9)
7. Help me improve stamina (6)
8. Increase capability to do more exercise (longer/more intense) (6)
9. Help me build/maintain muscle (5)
10. Help maintain/improve my ability to be active (e.g., mobility) (4)
11. Improve my ability to perform a specific activity (e.g., daily life) (3)
12. Increase metabolism (2)
13. Increase speed/agility (2)
14. Help me build/maintain flexibility (1)
15. Help my body recover from a previous activity (1)
16. Improve circulation (1)
17. Improve respiratory system functioning (1)
Social outcome expectations (n)
Exercise will …
1. Allow me to make/maintain social relationships (6)
2. Allow me to spend time with my pet (2)
Self-evaluative outcome expectations (n)
Exercise will …
1. Help me relieve stress/anxiety (20)
2. Increase self-confidence (20)
3. Increase my energy levels (18)
4. Improve my mood (16)
5. Help me feel more comfortable/accepting of my body (help with body image) (10)
6. Help me feel better (7)
7. Give me a sense of personal accomplishment/pride (5)
8. Provide a sense of enjoyment (4)
9. Increase motivation to exercise (4)
10. Decrease fatigue (4)
11. Improve mental focus/concentration (3)
12. Help me stay calm (1)
13. Increase motivation for other tasks (1)

(continued)

Table H.1
Elicited positive exercise outcome expectations (N = 87) (continued)

General health outcome expectations (n)
Exercise will …
1. Improve/maintain my health (23)
2. Help me sleep better (16)
3. Improve my general fitness (10)
4. Increase positive mental health (7)
5. Increase my desire to eat healthy (3)
6. Improve a health condition/chronic disease (3)
7. Improve quality of life (1)
8. Promote a healthy lifestyle (1)
Other outcome expectations (n)
1. Establish a routine/work-life balance (5)
2. Allow me to spend time in nature (4)
3. Allow me to have personal time (time to myself) (3)
4. Allow me to be a role model for my children/others (3)
5. Other (2)